

Controlled Substance Compliance & Shipping (CSCS) Expert community

Improving the understanding of controlled substances and shipping
legislation around the world

Jessie Bin Song, Controlled Substance Compliance Expert Community Lead, Merck

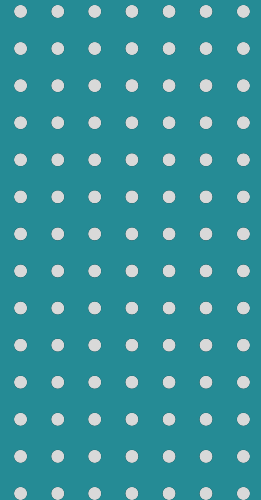
Jack DeCicco, Shipping Expert Community Lead, GSK

Akos Papp, Product Manager of Compliance Checker, cHemTS and JChem for Office, ChemAxon

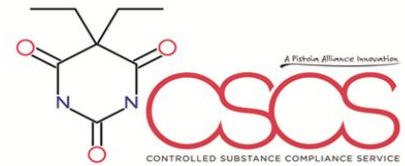
Ania Hajdukiewicz, Global Head Trade Compliance, Novartis

Birthe Nielsen, CSCS Expert Community Manager, Pistoia Alliance

CSCS@pistoiaalliance.org



Agenda



Controlled
Substance
Compliance &
Shipping
(CSCS) Expert
Community

- CSCS overview and mission statement
- CSCS activities: communicating with regulators & controlled substance screening tools
- Members' perspective
- Panel discussion
- Closing remarks / how to join the communities

Controlled Substance Compliance & Shipping (CSCS) Expert Community

Project manager
cscs@pistoiaalliance.org



Problem Statement:

Legislation relating to pharma R&D is changing rapidly; each change adds complexity and widened controls. Remaining compliant in this complex environment is an ever-growing challenge and consequences for breaches are severe.

Compliance is also important in shipping. Customs, cold chains, dangerous goods and infectious material legislation all make R&D shipping complex.

Value Proposition:

High levels of compliance are vital to the credibility of and public trust in life science R&D. To assist its members, the CSCS Expert Communities provide a forum for compliance professionals, researchers, compound and shipping managers to share best practices and update their awareness of new legislation.

Project member:

The expert communities are made up of major pharmaceutical companies and specialist software providers. It is voluntary for the member companies to share their knowledge and experience.

Project champions:

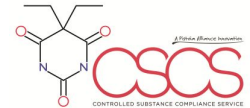
- Jack DeCicco, GSK (Shipping Expert community)
- Jessie Bin Song, Merck (Controlled Substance Compliance Expert community)

Steering Committee:

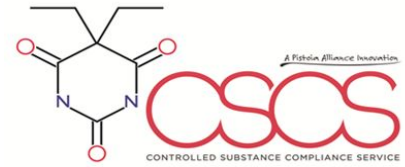


Project deliverables:

- Round table discussions
- Seminars
- Discussion and collaboration with expert external speakers and with independent and quasi-judicial monitoring bodies



CSCS - Mission



The Community focuses on tackling the challenges we face, developing solutions, communicating with regulators, and learning from each other to stay current and compliant with legislations governing controlled substance and shipping activities.

COMMUNITY OF EXPERTS

Controlled Substance Compliance & Shipping Expert Community


Our community of experts aims to improve the understanding of controlled substances and cross-border shipping legislation worldwide.



TOOLS

Controlled Substances Squared

FIND OUT MORE



TOOLS

Compliance Checker

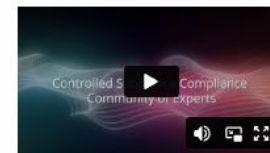
FIND OUT MORE



CSCS INTRODUCTION

Information pack download

CLICK TO DOWNLOAD



Stay Up-to-Date

Work Email Address*

First name*

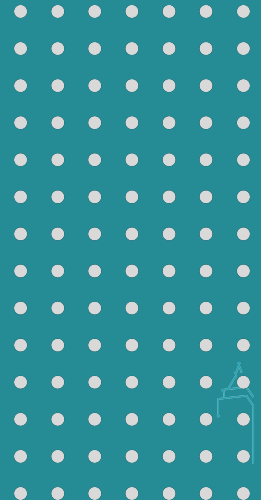
CSC & Shipping Expert communities

Case study: analysis of the effect of a generic regulation on pharma research and communicating it with the regulatory body

Akos Papp, CSCS SC, ChemAxon

apapp@chemaxon.com

CSCS@pistoiaalliance.org



Cloud and On prem

Controlled Substances Squared
Is my chemical a controlled substance?

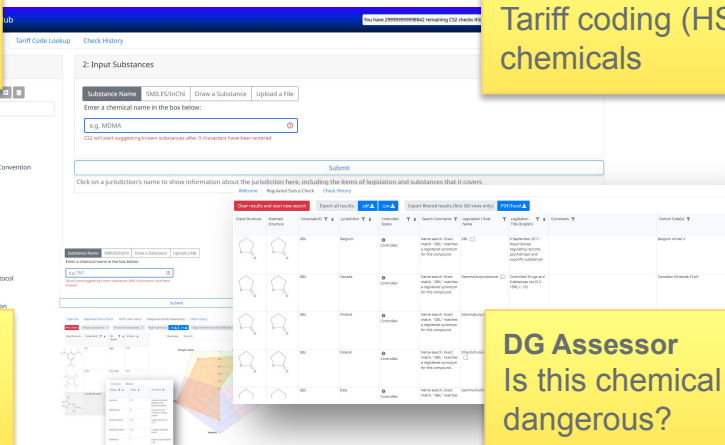
Expedichem
Tariff coding (HS/CN codes) for chemicals

Abuse Potential assessments

Bespoke assessments and reports for FDA / EMA submissions for CNS penetrant candidates

DG Assessor

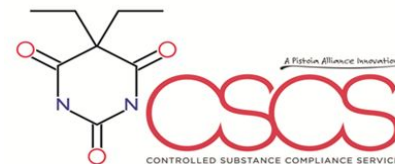
Is this chemical likely to be dangerous?



Used by 5 of the worlds top 10 Pharma at the Enterprise level...
plus chemical suppliers, regulators, CROs and specialist Controlled Substance suppliers globally.

Fully automate daily checks of millions of chemicals. Weekly legislation updates for over 30 countries. Plus much more

Chemaxon – Compliance Checker & cHemTS



SaaS offerings



**Security
ISO27001**



Accuracy



High performance



Compliance Checker

Identification of control substances

- Markush Search Technology
- Similarity calculation
fingerprint and language-model-encoded vector representations

cHemTS

assignment of Harmonized Tariff System codes

- FDA drugs lists, Chemical Appendix and the Pharma Agreement country-specific alternatives
- Automatic mixture vs salt form determination



Misuse of Drugs Act 1971 (UK)

1977

the very first generic legislation
amphetamine derivatives and substituted tryptamines





2008

The first detection a synthetic cannabinoid *

JWH-018, in a product sold under the brand name 'Spice',
Germany, Austria

2009

First generation synthetic cannabinoid legislation





2013

Second generation synthetic
cannabinoid

2014

ACMD Report on 'Third
Generation' synthetic
cannabinoids



ACMD report

“ Simply increasing the number of generic controls to cover the broad range of psychoactive cannabinoid structures which are being identified using a similar approach to the existing controls **would require an extremely long list** of additional paragraphs. It is therefore proposed to adopt a **different approach**, based on defined modifications of a ‘model’ **“** compound, 1-pentyl-3-(naphthoyl)indole (‘JWH-018’)

<https://www.gov.uk/government/publications/third-generation-synthetic-cannabinoids>

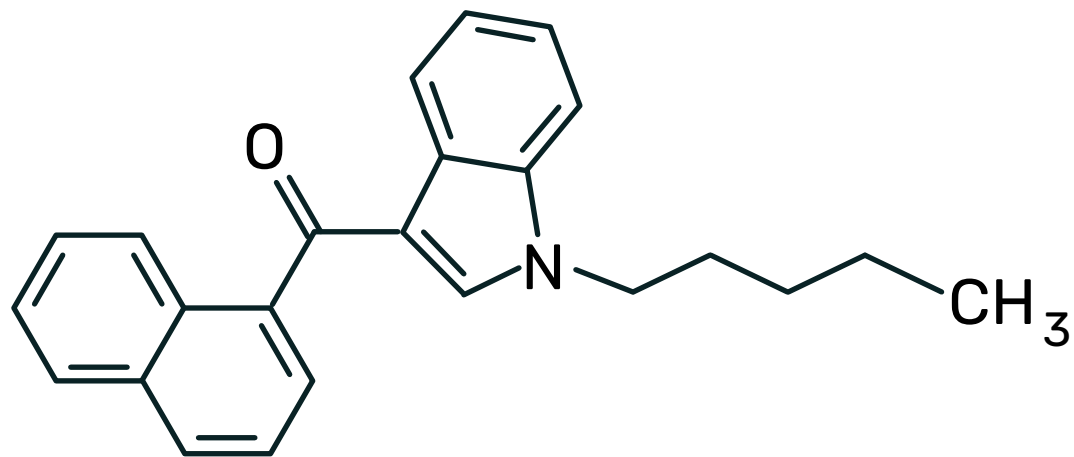
*ACMD: Advisory Council on the Misuse of Drugs



2016

Third generation synthetic
cannabinoid



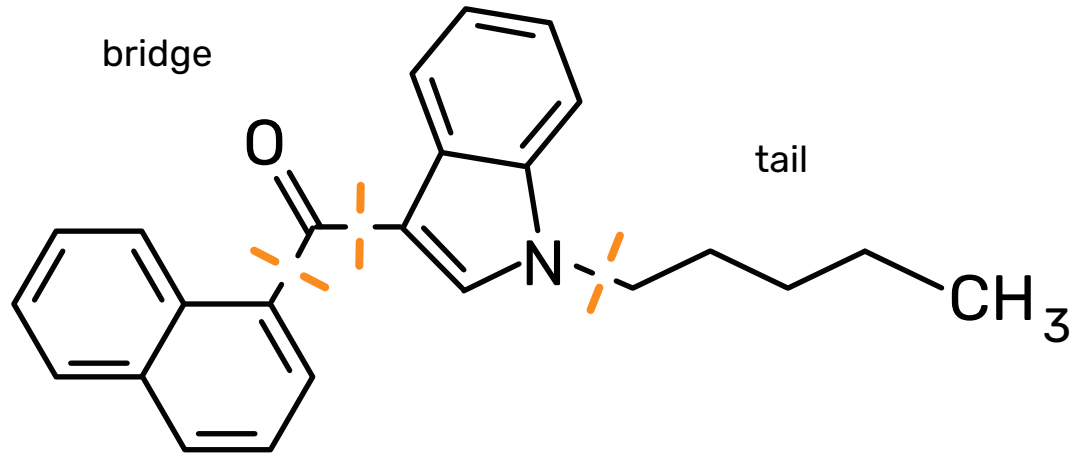


JWH-018

core structure

bridge

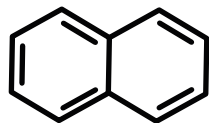
secondary structure



tail

JWH-018

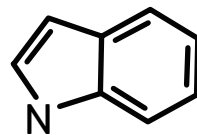
secondary structure



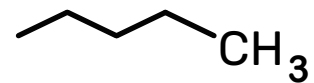
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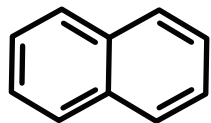
core structure



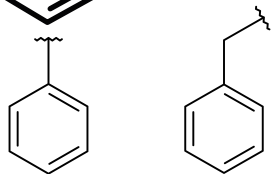
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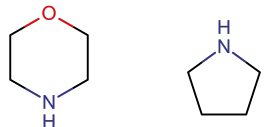
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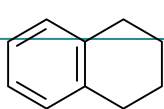
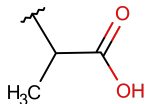
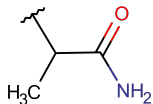
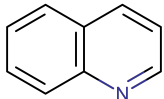
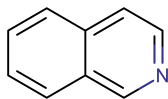
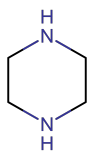
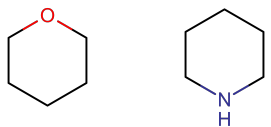
cycloalkyl



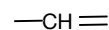
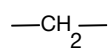
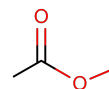
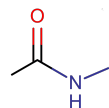
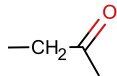
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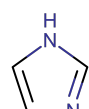
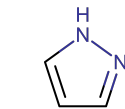
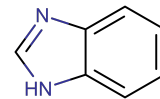
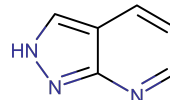
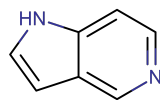
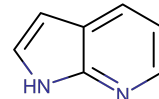
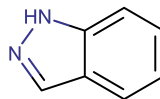
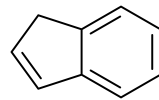
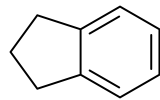
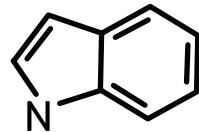
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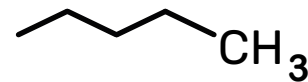
bridge



core structure



tail

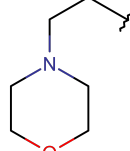
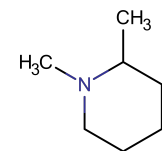
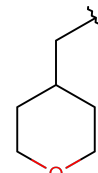
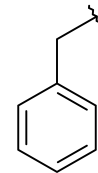


Alkyl

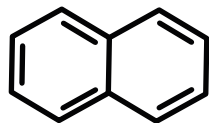
cycloalkyl

Alkenyl

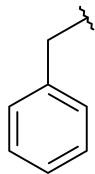
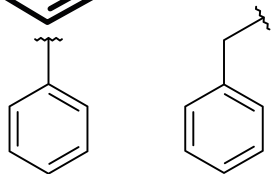
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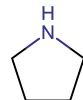
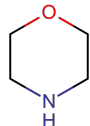
secondary structure



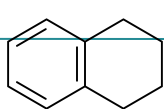
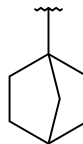
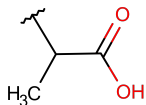
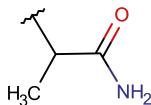
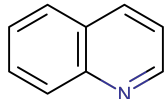
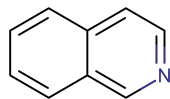
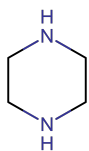
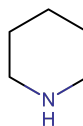
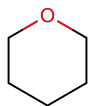
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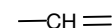
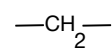
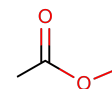
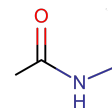
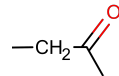
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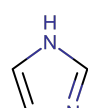
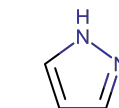
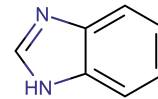
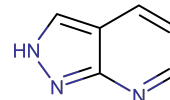
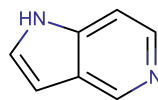
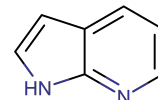
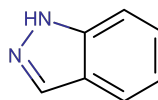
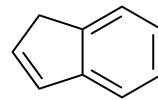
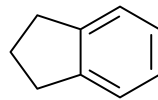
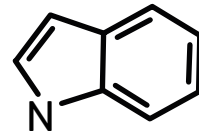
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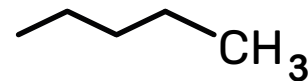
bridge



core structure



tail

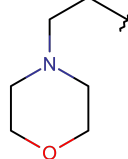
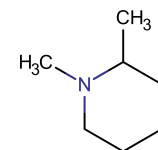
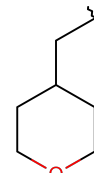
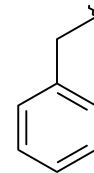


Alkyl

cycloalkyl

Alkenyl

cycloalkyl



and whether or not substituted in any of the linked sub-structures with one or more univalent substituents

Tackling the Issue

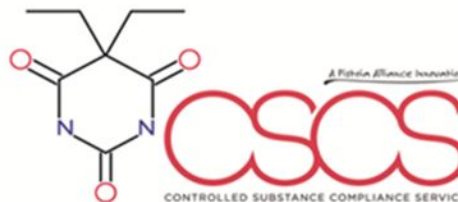
The Association of the
British Pharmaceutical
Industry



BRITISH
PHARMACOLOGICAL
SOCIETY




Pistoia Alliance



ACM
D



Home
Office



Parliament



The amendment in the definition



Generic definition: A revision for synthetic cannabinoids in order to reduce the scope

2016

any of the sub-structures have been modified, and whether or not substituted in any of the linked sub-structures with one or more **univalent** substituents

2019

whether or not substituted in any of the linked sub-structures with a **benzyl or phenyl** group and whether or not such compound is further substituted to any extent with **alkyl, alkenyl, alkoxy, halide, haloalkyl or cyano** substituents



2019

(Amendment) Order 2019



2021

Cumyl-PeGaClone - Convention on Psychotropic Substances

Schedule II of the 1971 Convention on
Psychotropic Substances

2022

Home Secretary

2021

Cumyl-PeGaClone - Convention on Psychotropic Substances

Schedule II of the 1971 Convention on
Psychotropic Substances

2022

Home Secretary

2023

ACMD Cumyl-PeGaClone and other recently encountered synthetic cannabinoid receptor agonists

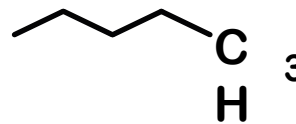
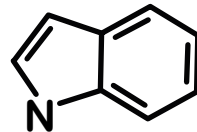
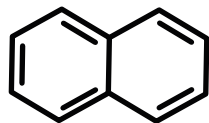


secondary structure

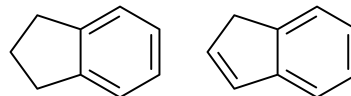
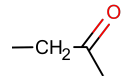
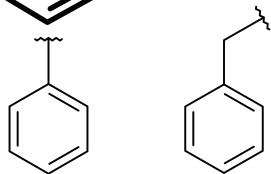
bridge

core structure

tail

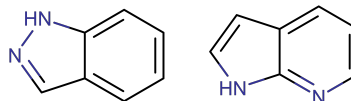
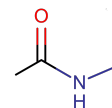
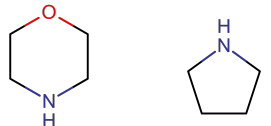


cycloalkyl



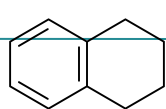
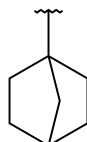
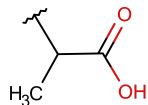
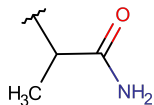
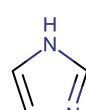
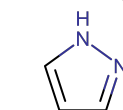
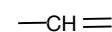
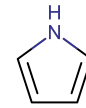
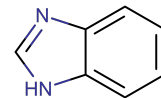
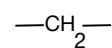
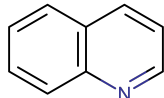
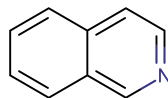
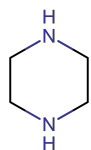
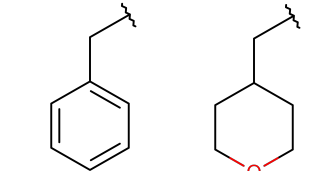
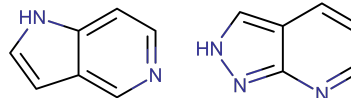
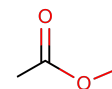
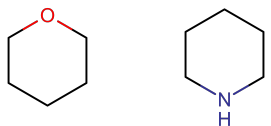
Alkyl cycloalkyl

cycloalkyl



Alkenyl cycloalkyl

cycloalkyl

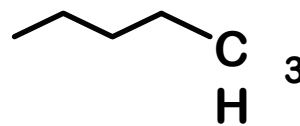
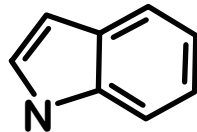
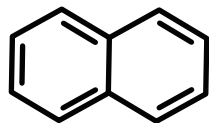


secondary structure

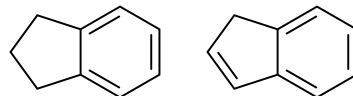
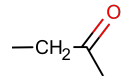
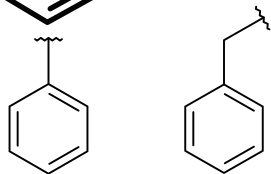
bridge

core structure

tail

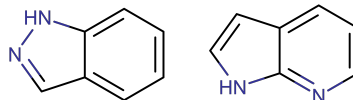
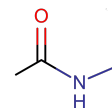
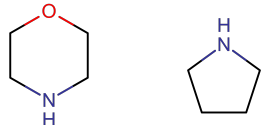


cycloalkyl



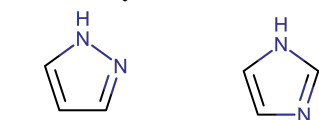
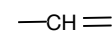
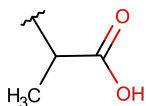
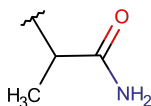
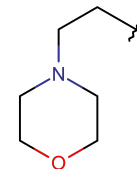
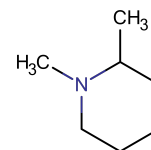
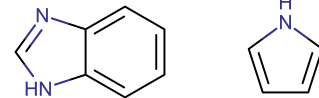
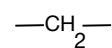
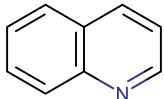
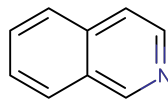
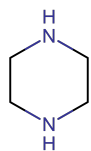
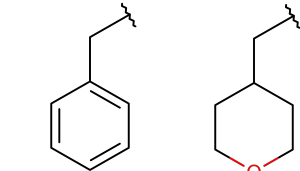
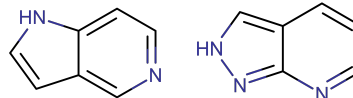
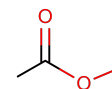
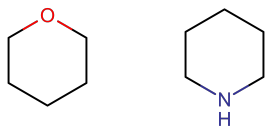
Alkyl cycloalkyl

cycloalkyl



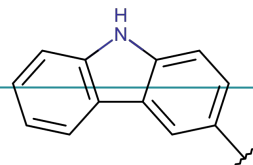
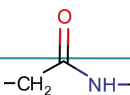
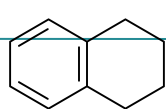
Alkenyl cycloalkyl

cycloalkyl



NO Tail

-SO₂-

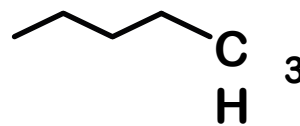
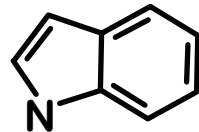
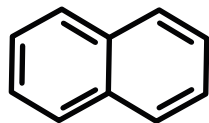


secondary structure

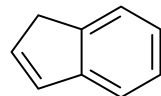
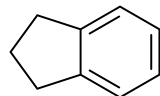
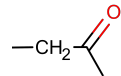
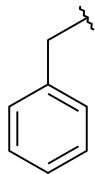
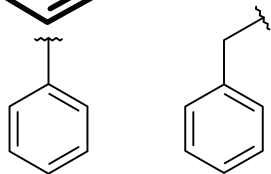
bridge

core structure

tail

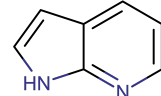
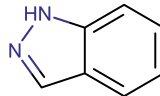
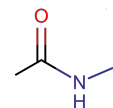
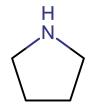
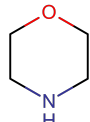


cycloalkyl



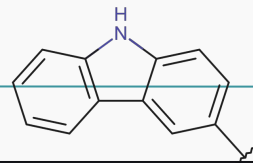
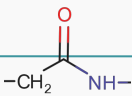
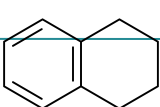
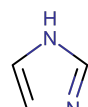
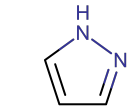
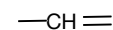
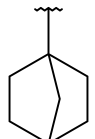
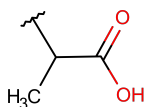
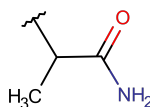
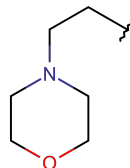
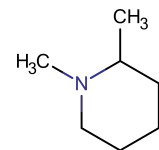
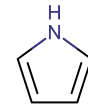
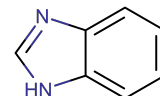
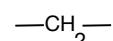
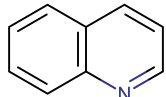
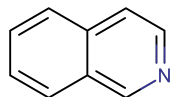
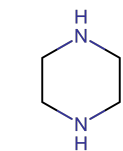
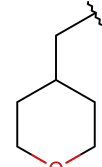
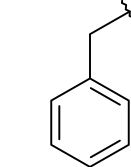
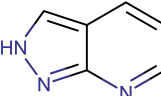
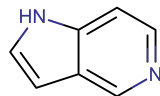
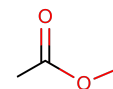
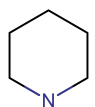
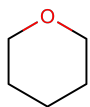
Alkyl

cycloalkyl



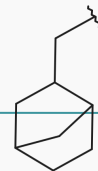
Alkenyl

cycloalkyl



NO Tail

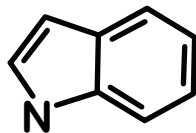
SO₂



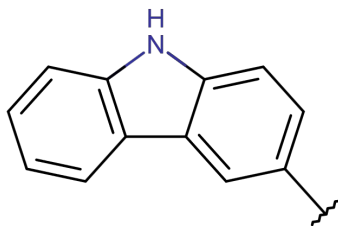
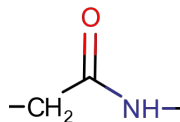
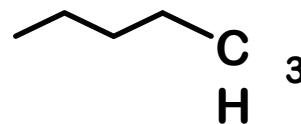
bridge



core structure

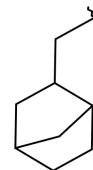


tail



NO Tail

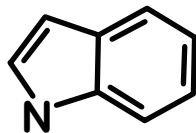
-SO₂-



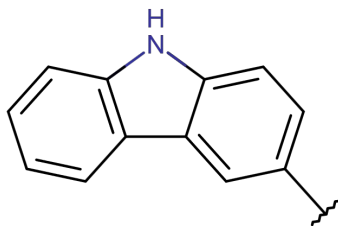
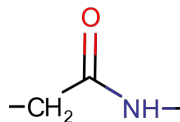
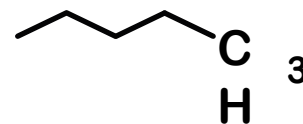
bridge



core structure

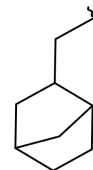


tail

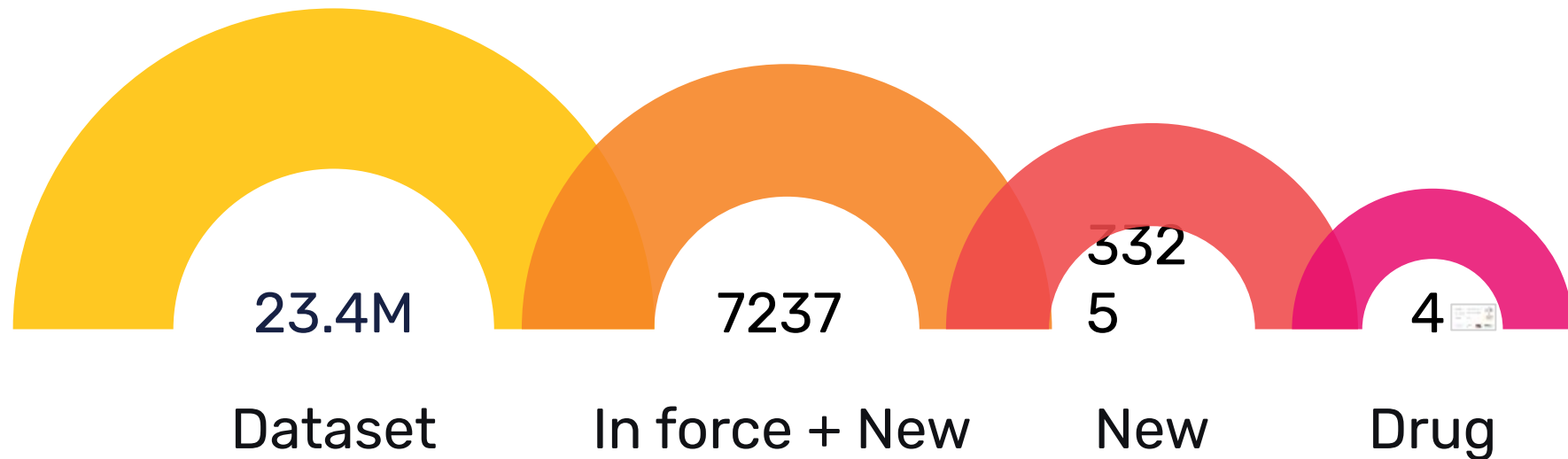


NO Tail

-SO₂-



Analysis of ChEMBL33



* Analysis done by Chemaxon using Compliance Checker



Medetomidin
e

surgical anesthetic and analgesic



Dexmedetomidin
e

sedation and anesthetic premedication



Detomidin
e

sedative

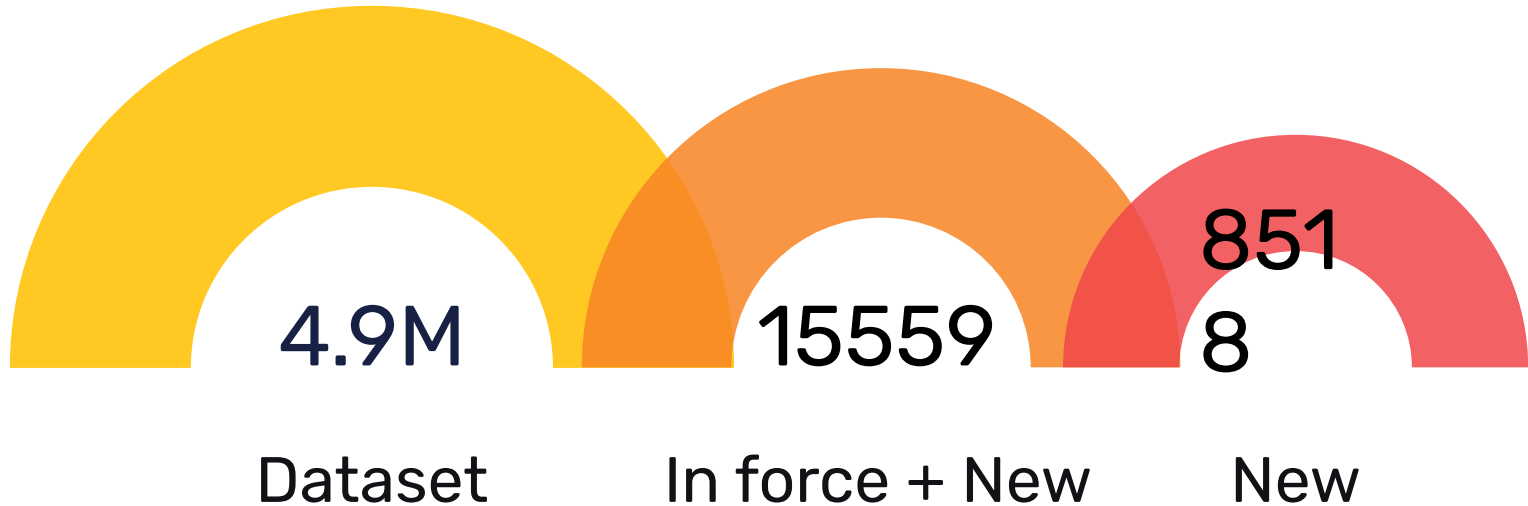


Clotrimazol
e

antifungal



Analysis of the research collection of a Pharma



* In house analysis using Compliance Checker

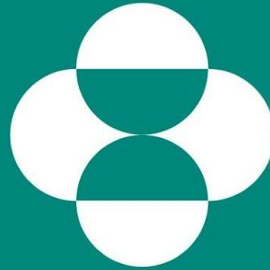
New

	In force	New	Increase
ChEMBL33	3912	3325	85%
Pharma	7041	8518	121 %

Most of the new hits are against the “No tail” structures.

PISTOIA ALLIANCE CONTROLLED SUBSTANCE COMPLIANCE COMMITTEE (CSCS)

MEMBER PERSPECTIVE



INVENTING
FOR LIFE

Pistoia Alliance 2023 Boston Conference

Jessie Bin Song

Merck & Co., Inc.

Director, Controlled Substance Compliance

Before We Start

Disclaimer: Information contained in this presentation and any related discussion are solely the views and experiences of the presenter and should not be presumed to reflect the position of Merck & Co., Inc.

Consult your company's expert, compliance and legal group for advice on specific questions and issues.

Topics

- What is a controlled substance?
- Laws and Regulations
- Managing Controlled Substances in Research Activities
- Pistoia Alliance CSCS Community

Key Definitions...

Controlled Substance: A drug or chemical that is restricted from access by government entities (or other competent authorities) around the world because of its potential for abuse or diversion. They include their isomers, esters, ethers, salts, and salts of isomers, esters, and ethers, whenever the existence of such isomers, esters, ethers, and salts is possible within the specific chemical designation.



Regulated Precursor Chemical: A chemical that has a legitimate medical, scientific, or industrial use, but can also be used in the illicit manufacture of Controlled Substances.

Title 21 United States Code (USC) Controlled Substances Act

(6) The term "controlled substance" means a drug or other substance, or immediate precursor, included in schedule I, II, III, IV, or V of part B of this subchapter. The term does not include distilled spirits, wine, malt beverages, or tobacco, as those terms are defined or used in subtitle E of the Internal Revenue Code of 1986.

UK Misuse of Drugs Act 1971

- (2) It shall be the duty of the Advisory Council to keep under review the situation in the United Kingdom with respect to drugs which are being or appear to them likely to be misused and of which the misuse is having or appears to them capable of having harmful effects sufficient to constitute a social problem, and to give to any one or more of the Ministers, where either the Council consider it expedient to do so or they are consulted by the Minister or Ministers in question, advice on measures (whether or not involving alteration of the law) which in the opinion of the Council ought to be taken for preventing the misuse of such drugs or dealing with social problems connected with their misuse, and in particular on measures which in the opinion of the Council ought to be taken—

Laws and Regulations

- ❑ Controlled Substances are highly regulated worldwide
- ❑ Over 190 countries are signatories to International Conventions:
 - ✓ The 1961 UN Single Convention on Narcotic Drugs
 - ✓ The 1971 UN Convention on Psychotropic Substances
 - ✓ The 1988 UN Convention on Precursor Chemicals
- ❑ Common Requirements:
 - ✓ Maintain accurate inventories at all time.
 - ✓ System / controls in place to detect and prevent loss, theft and diversion.

Country	Key Legislation
U.S.	Controlled Substances Act 1970 Chemical Diversion & Trafficking Act 1988
UK	Misuse of Drugs Act 1971
Mexico	General Health Law Regulations in Health Related Goods
Germany	Narcotics Act of 1981, as amended Betäubungsmittelgesetz ("BtMG")
Netherlands	Opium Law Act
Japan	Narcotics & Psychotropic Control Law, Stimulants Control Law, Narcotics Special Law
China	Decree of the State Council of the People's Republic of China No. 442 (2005) and No.666 (2016), List of Narcotic and Psychotropic Drugs

International Narcotics Control Board (INCB)

- ❑ Monitoring and supporting governments' compliance with the international drug control treaties
- ❑ **Goals:** to limit the production, manufacture, export, import, distribution and stocks of, trade in and use and possession of the controlled drugs so that they are used exclusively for medical and scientific purposes.
- ❑ The production and distribution of controlled substances must be licensed and supervised by Governments with estimates and statistical quantity returns to INCB.
- ❑ The number of substances placed under control continues to increase.
- ❑ Each country has additional substances under control in addition to the INCB lists



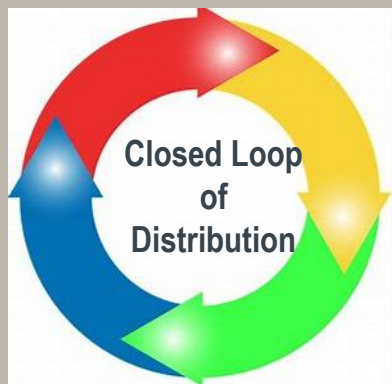
Managing Controlled Substances in Research Activities

Governance and Compliance Program

- ❑ Sponsored by Management
- ❑ Proper governance structure
- ❑ Processes, Systems and Procedures
- ❑ Stays current

Discovery & Usage

- ❑ Ability to determine the control status of discovery compounds
- ❑ Usage and inventory tracking
- ❑ Inventory count
- ❑ Security during usage
- ❑ Handling of waste, unwanted, expired controlled substances



Purchasing

- ❑ Screen to confirm the control status before purchasing
- ❑ Validate suppliers with proper controlled substance registrations
- ❑ Established receiving process

Shipment

- ❑ Screen to confirm the control status for both originating and destination countries
- ❑ Properly licensed recipient
- ❑ Authority issued import / export permit per shipment
- ❑ Shipment tracking

Pistoia Alliance Controlled Substance Compliance & Shipping (CSCS) Committee

- ✓ Open forum for benchmarking and best practice sharing
- ✓ Collaboration to develop solutions that benefit the industry
- ✓ One voice on behalf of the industry
- ✓ Networking

THANK YOU



Members perspective – Jack DeCicco, GSK



2023-11-09 15:15:10



**Ania Hajdukiewicz, Global Head
Trade Compliance**
Boston
November, 15, 2023

 **NOVARTIS** | Reimagining Medicine



Locations and functions overseen by the Controlled Substance and Trade Compliance team

What organizations do we work with?

- CROs based in various regions like US, Europe, UK, Asia
- Clinical trials supply taking place in different countries
- Government agencies such as: Swissmedic, UK Home Office, FDA, CDC, DEA, BIS etc.



What functions do we support and where:

- Research labs in the US, Switzerland, UK and China
 - Early discovery to lead optimization
 - Animal experiments
- Specific groups within Development function

Activities overseen by the Controlled Substance and Trade Compliance team



Activities covered to avoid diversion:

- Monitoring and record keeping of all chemicals life cycle steps: acquisition, synthesis, use, transport, disposal
- Utilization of Compliance Checker tool
- Supply and use monitoring of CS including Rx at some US sites (state specific)
- Maintain licensure, policies, infrastructures

How does Pistoia Alliance CSCS make a difference

Case 1:

2015 Massive expansion of chemical space controlled by UK Home Office. Major operational problem associated with one NVS compound in clinical trial

2019 UK Home Office reduced the chemical space reducing the number of substances controlled in the UK. Pistoia was a **key and trustable influencer as representing a community of Pharma companies**

Case 2:

Regulations missinterpretation can have significant consequences. Roundtables allow us to align on our understanding and benefit from companies expertise on other country regulations

Case 3: Automated identification of Controlled Substances in large libraries. Two Solutions on the market developed by ChemAxon and Scitegrity. Novartis takes advantage of one of them to screen our chemical inventory.

Chemaxon's solutions originated from the Pistoia CSCS Community

Ákos Papp



Chemaxon's Solutions

To respond to the CSCS RFP

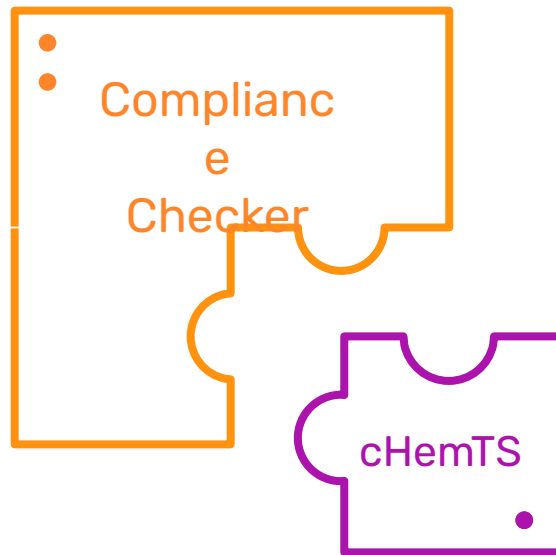
Compliance Checker

To meet the Shipping group requirements

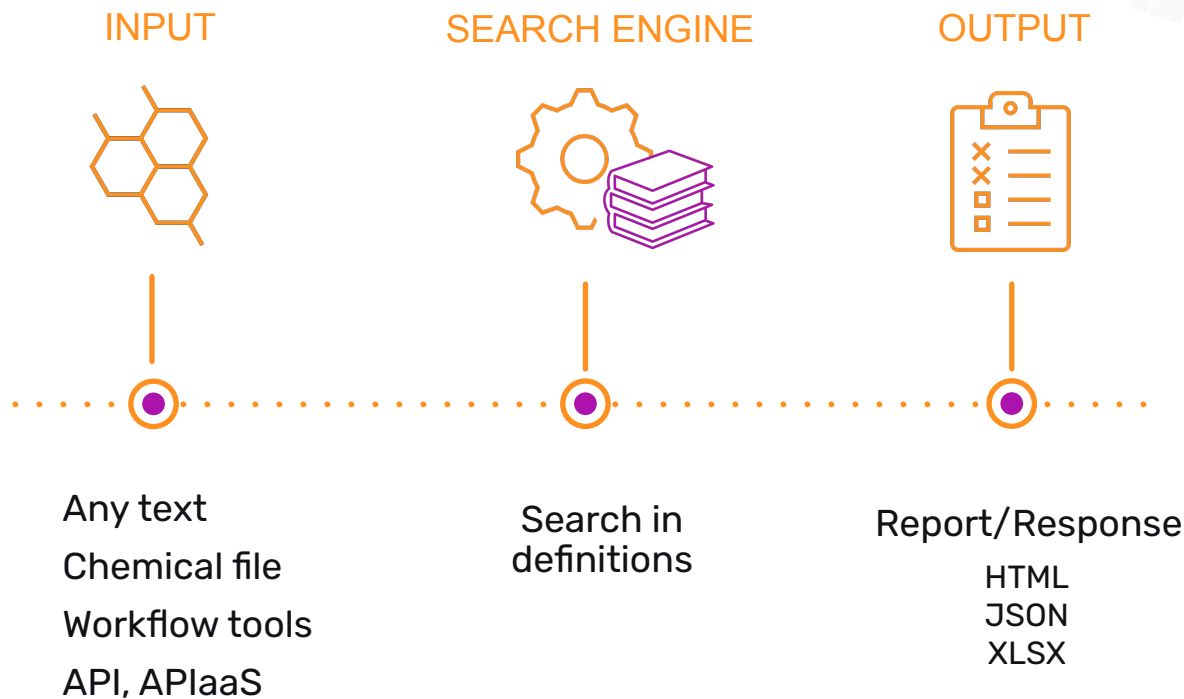
cHemTS



Modular system



System overview





Compliance Checker

by  Chemaxon

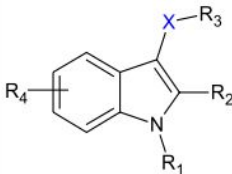
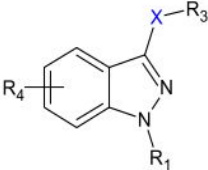
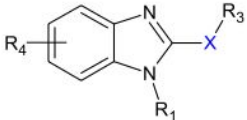


Identifying controlled substances in generic definitions

generic group
definitions



A part of the legislation on synthetic cannabinoids

4. SYNTHETISCHE CANNABINOÏDEN: stoffen die derivaten zijn van	4 . CANNABINOÏDES SYNTHÉTIQUES : substances qui sont dérivées de :	
<ul style="list-style-type: none"> - indoles (Fig. 4a en 4d) - indazoles (Fig. 4b en 4e) - benzodiazoles (Fig. 4c, 4f, 4g en 4h) - pyrroles (Fig. 4i) 		
<p>Fig. 4a</p>	<p>Fig. 4b</p>	 <p>Fig. 4c</p>
<p>X = -CH₂-, -C(=O)-, -CH₂O-, -C(=O)O- of -C(=O)NH-;</p> <p>R₁: C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3} (n=1-7), phenyl, benzyl, cyclohexylmethyl; al dan niet verder gesubstitueerd met een of meerdere van volgende functionele groepen of een combinatie hiervan: OH, C(=O)OH, halogeen, CN, tetrahydropyryl, morfolinil, N-methylpyrrolidinyl, N-methylpiperidinyl of een andere functionele groep met maximaal 7 C-atomen.</p> <p>R₂: H, C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3} (n=1-7)</p> <p>R₃: phenyl, benzyl, phenylethyl, naphthalenyl, adamantanyl, quinolinyl, tetracyclopropyl, of een functionele groep met maximaal 7 koolstofatomen; al dan niet verder gesubstitueerd met een of meerdere van volgende functionele groepen of een combinatie hiervan: halogeen, OH, CH₂OH, C(O)OH, azide, dimethylamino, CN, NO₂ of een functionele groep met maximaal 7 koolstof -atomen.</p>	<p>X = -CH₂-, -C(=O)-, -CH₂O-, -C(=O)O- ou -C(=O)NH-;</p> <p>R₁: C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3} (n=1-7), phényl, benzyl, cyclohexylméthyl ; ce groupe peut être substitué oui ou non avec un ou plusieurs, ou une combinaison, des groupes fonctionnels suivants : OH, C(=O)OH, halogène, CN, tetrahydropyryl, morpholinyl, N-méthylpyrrolidinyl, N-méthylpipéridinyl, ou un autre groupe fonctionnel contenant au maximum 7 atomes de carbone.</p> <p>R₂: H, C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3} (n=1-7)</p> <p>R₃: phényl, benzyl, phénylethyl, naphthalenyl, adamantanyl, quinolinyl, tetracyclopropyl, ou un groupe fonctionnel contenant au maximum 7 atomes de carbone; ce groupe peut être substitué oui ou non avec un ou plusieurs, ou une combinaison, des groupes fonctionnels suivants : OH, halogène, CH₂OH, C(O)OH, azide, diméthylamino, CN, NO₂ ou un autre groupe fonctionnel contenant au maximum 7 atomes de carbone</p>	

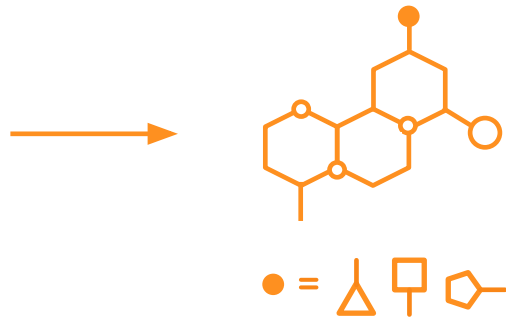


Generic definitions representation

generic group
definitions



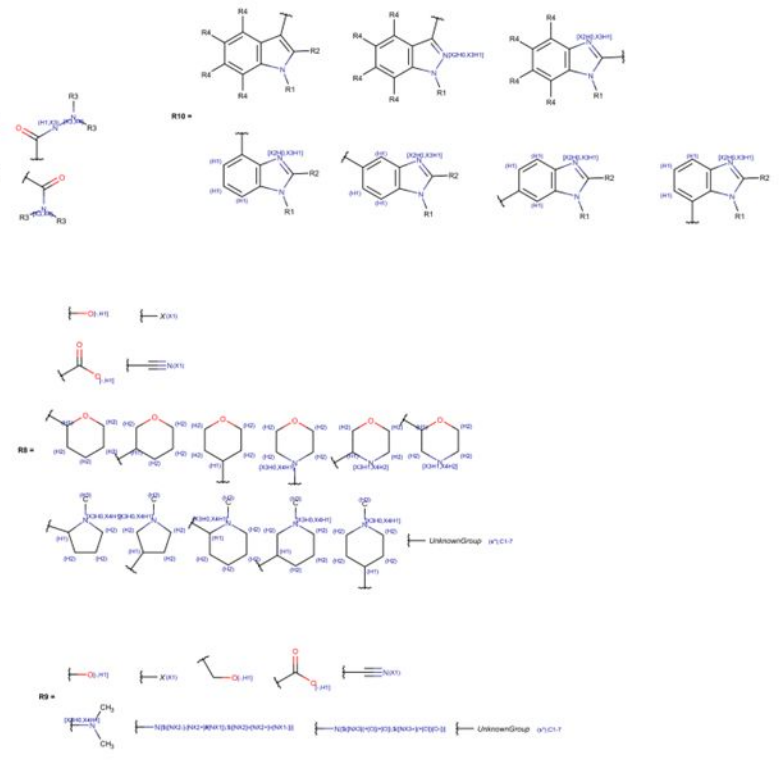
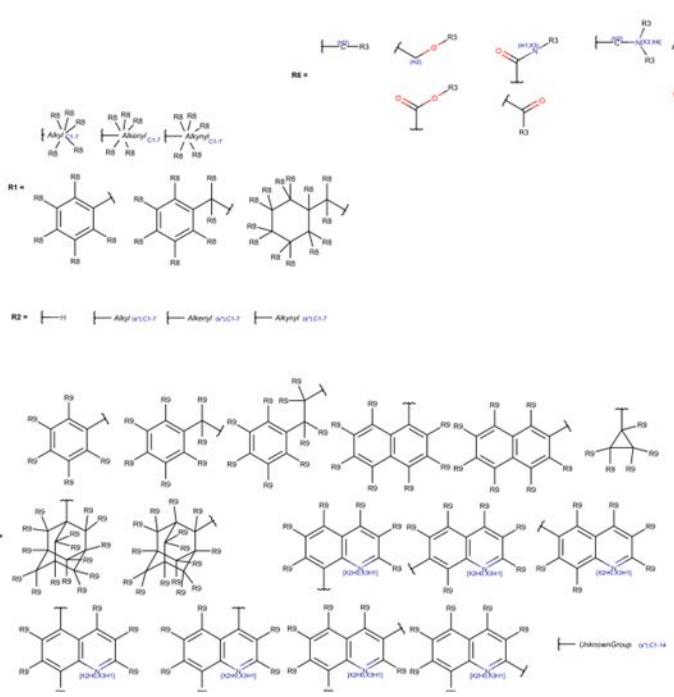
Markush
structures



Markush structure

R1 *
 R2 *
 R3 1-2, restH
 R4 0-5, restH
 R5 *
 R6 0-5, restH
 R7 0-5, restH
 R10 *

R10 - R8

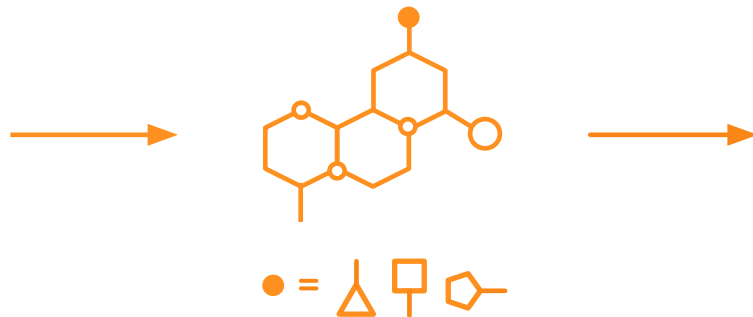


The Jchem Markush search technology

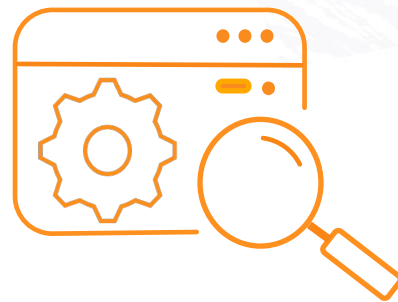
generic group
definitions



Markush
structures



search
engine



The “substantially similar” structures to the US Schedule I&II substances

Federal Analogue Act - 21 U.S.C. § 813

“... the chemical structure of which is substantially similar to the chemical structure of a controlled substance is also controlled ...”

subjective / objective



Similarity models



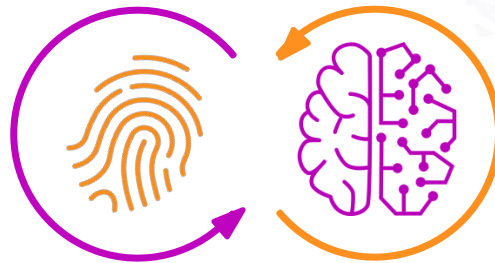
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“... the chemical structure of which is substantially similar to the chemical structure of a controlled substance is also controlled ...”

subjective / objective

Similarity calculation



synergistic approach
fingerprint methods combined
with machine learning



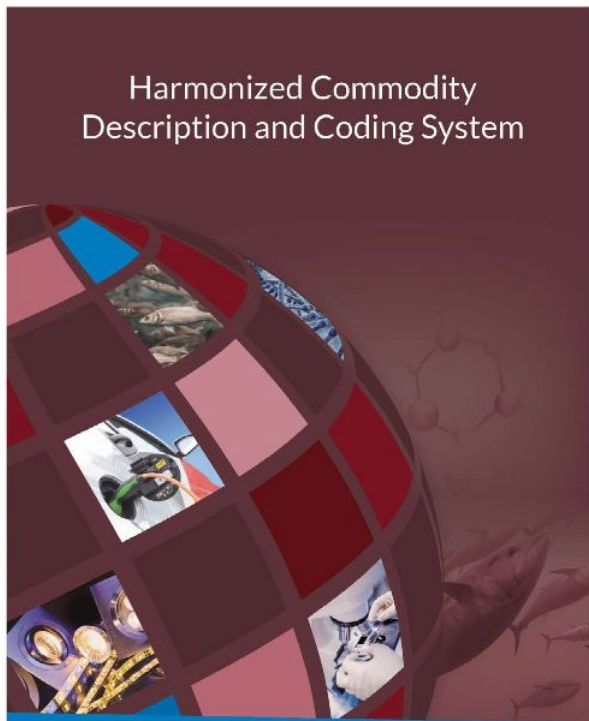


cHemTS

by  Chemaxon



WCO



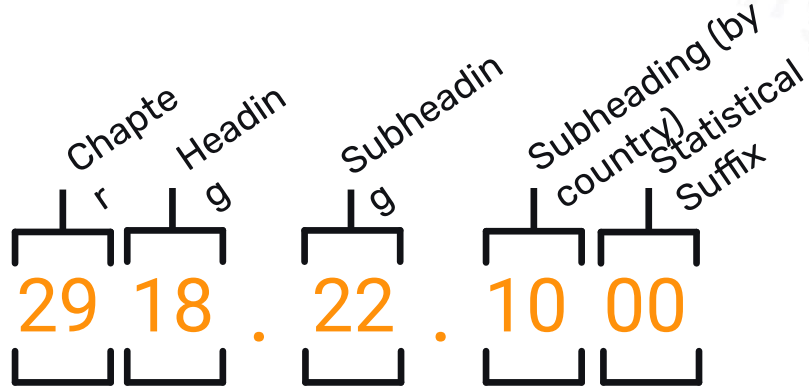
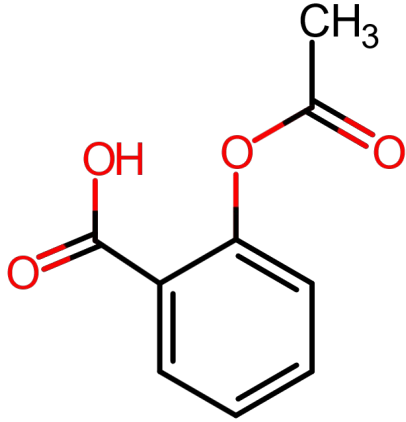
HS Explanatory Notes (2022 Edition)



The Compendium of Classification Opinions (2022 Edition)



HTS code in pharmaceutical industry



Carboxylic acids with additional oxygen function...

Organic chemicals with additional oxygen

O-Acetylsalicylic acid, its salts and esters

O-Acetylsalicylic acid (Aspirin)



Lookup in official lists relevant for pharma



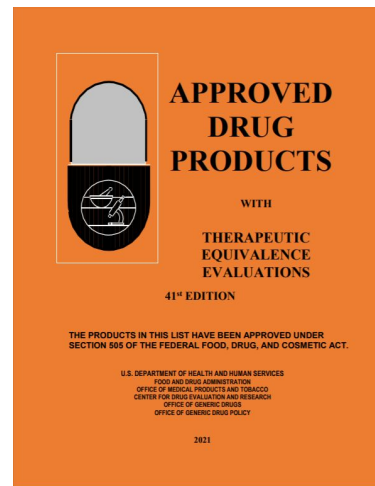
Chemical Appendix

 Orange and Green Book



WORLD TRADE
ORGANIZATION

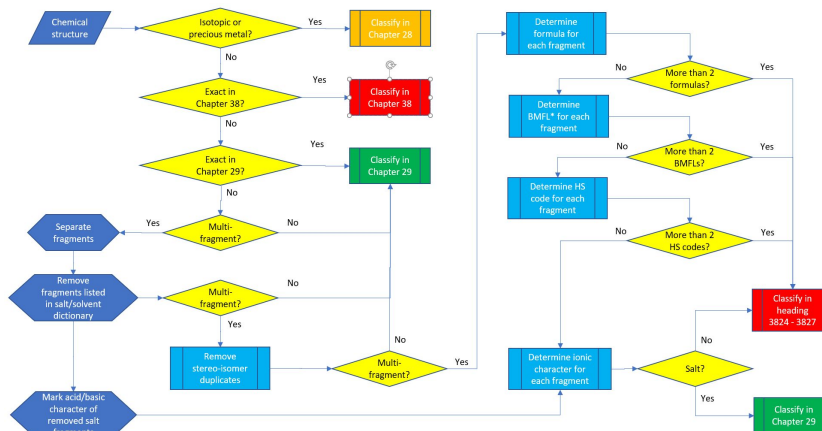
Pharma Agreement



Additional unique features

- Classifications:
drug classes, pesticides, purity, derived from...
- Categorize as: vitamins, alkaloids, glycosides, antibiotics

- Automatic recognition of mixtures vs. salt forms
Ch 38 vs. Ch 29



*BMFL: Bemis-Murcko Framework Loose



What gives the CSCS group for a solution provider



Direct feedback on requirements



Real life problems from members



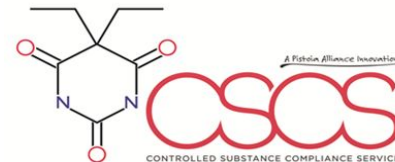
Communication with regulatory bodies



It is very useful to be a member of the CSCS group!



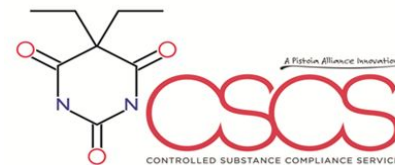
Your interest?



- Which countries or jurisdictions are you interested in tracking and interpreting regulations associated with controlled substances and shipping?
- Which countries or jurisdictions do your company currently have a fairly good understanding of tracking and interpreting regulations associated with controlled substances and shipping?
- Have you encountered any specific challenges or complexities related to controlled substance compliance in the mentioned countries or jurisdictions?
- Do you have any specific process or practices in place for monitoring the regulations in the identified countries and jurisdictions?
- Does your company engage external firms / services to understand the controlled substance landscape and/or interpret regulations? If yes, would you be willing to share the names and contacts?
- What suggestions do you have for the Pistoia Alliance to expand the scope better to better serve the community needs?
- Can we contact you in case we have further questions? (add email below)



Q&A / Panel Discussion



Jessie Bin Song, Compliance Director



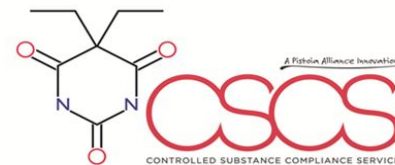
Akos Papp, Product Manager of Compliance Checker, cHemTS and JChem for Office



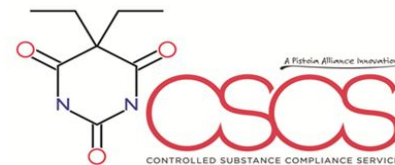
Ania Hajdukiewicz, Global Head Trade Compliance



Members feedback



How can I join?



- A company must be a member of the Pistoia Alliance
- Each company may send as many participants as they wish to the meetings
- You can join one or both expert communities
- Details on how to join: cscs@pistoiaalliance.org



Meet us and see our posters



Compliance Hub for Chemistry

By Bradley J. Jahnke, Dr. Maria Moreno, Dr. Aram A. B. de Sa, and Dr. Anshu

<https://www.scitegrity.com>

- Controlled drug/chemical detection
- Dangerous chemical alerting
- Tariff (HS/CN) coding for shipping
- Abuse liability assessments

Scitegrity and Pistoia

In 2014, Scitegrity, working with the Pistoia Alliance Controlled Substance Compliance Community built a tool to quickly and accurately identify if chemicals in research collections were regulated under controlled drug laws.

The tool, Controlled Substances Squared is now one part of Scitegrity's wider Compliance Hub platform. Compliance Hub simplifies and improves compliance safety within chemical research, supply and manufacturing.

It's used by 3 of the world's top 10 Pharmaceutical companies at the enterprise level, plus dozens of chemical suppliers, pharma and regulators globally.

Are any of my chemicals regulated?

Controlled drug regulations control just one common "hard" drug like Heroin or Cocaine, but also all related chemical species, plus precursor chemicals that can be used to synthesize the main drug of Abuse. Other regulations such as military drug use, chemical weapons convention and ozone depleting treaties also control chemicals commonly used in research and manufacturing.

These laws and the chemical control can differ significantly from country to country, even within Europe.

Controlled Substances Squared, within Compliance Hub, can automatically check all your chemicals against Controlled Drug laws in over 20 countries, including areas of controlled chemical space, in addition to chemical weapons conventions such as the Chemical Weapons Convention, Montreal ozone depleting protocol, INC and strategic export control regulations.



Controlled Substances Squared, Top 10 Phrases

Are any of my chemicals dangerous?



On Tuesday December 8, 2020, at approximately 10 pm EST an explosion occurred at Optima Chemical LLC in Belle, West Virginia. The incident led to one fatality, and two injuries as well as a shelter-in-place for community members within a 2 mile radius of the facility.

A pressure-rated rotary dryer containing a chlorinated isocyanurate compound exploded, causing a substantial fire and toxic chlorine release. Optima's estimated property damage from the incident was \$33.1 million.

Our Dangerous Goods Assessor module will have successfully predicted that the chemicals involved were at very high risk of an explosion.

Several of the approaches and algorithms (for example OSHA and REACH) it uses are now recommended by the US Government Chemical Safety Board as part of the Optima lessons learned, to help identify potentially explosive and self-reactive chemicals before they are used in research or production.

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www.scitegrity.com



Controlled Substance Compliance & Shipping Expert Community

What we do

We work with our members to assist them in their regulatory and compliance needs. We provide a platform for members to share best practices, insights, and experiences in their respective fields.

Our expertise comes from our deep understanding of controlled substances regulations and shipping requirements. We provide a platform for members to share best practices, insights, and experiences in their respective fields.

The CSOC is a not-for-profit organization that provides a platform for members to share best practices, insights, and experiences in their respective fields.

Our members include researchers, regulators, and industry professionals. We provide a platform for members to share best practices, insights, and experiences in their respective fields.

Activities 2021/22

Our members have participated in various activities throughout the year, including webinars, workshops, and conferences. We provide a platform for members to share best practices, insights, and experiences in their respective fields.

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Key Information
 Chair: CSOC Justice Society
 Project manager: Brian Hannon
 Contact us: info@scitegrity.com
 Goal of the Program Community
 To improve the understanding and enforcement of controlled substances and shipping legislation and regulations.

Sponsors/partners
 Chemaxon
 Scitegrity
 MERCK
 Pfizer
 CSOC

Join the steering committee, we ask for a \$2k yearly contribution.



if you would like to join the CSOC & Shipping Expert Community, please get in touch with us at info@scitegrity.com

Pistoia Alliance: Lowering barriers to R&D innovation
 Our members have participated in various activities throughout the year, including webinars, workshops, and conferences. We provide a platform for members to share best practices, insights, and experiences in their respective fields.

Integrated Solution for Controlled Substances and Tariff Coding

Small business and global enterprises alike face stringent regulatory landscapes that demand meticulous oversight of controlled substances and adherence to international trade codes.

By utilizing cloud technology and a microservices based architecture, Chemaxon offers a scalable platform that allows companies to subscribe to the services that match their needs and adjust their usage as their business grows. Choosing one of our solutions allows our clients to benefit from our commitment to quality management and data security, as evidenced by our ISO 9001:2015 and ISO 27001:2017 certifications. This ensures full compliance with industry standards but also reliability and protection in managing sensitive pharmaceutical data.

For small and emerging businesses, it provides state-of-the-art compliance functions with considerations for the quality of molecule assessed and proceeding with sign-off that meets and exceeds their business goals. Choosing one of our solutions allows our clients to benefit from our commitment to quality management and data security, as evidenced by our ISO 9001:2015 and ISO 27001:2017 certifications. This ensures full compliance with industry standards but also reliability and protection in managing sensitive pharmaceutical data.

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From on-premise to Software as a Service (SaaS) Compliance Checker and on-premise Tariff Coding Software as a Service (SaaS) module to create a versatile compliance solution suitable for businesses of every size. The deployment packages are designed for both virtual Private Cloud environments and on-premise installations.



Streamline Compliance and Shipping From Startups to Industry Giants

Akoe Papp akoe.papp@chemaxon.com

Precision at the Core: Ensuring Accuracy
 Enhancing Compliance through Advanced Search Technology for Specific Group Definition
 Drug markets have become complex with the proliferation of synthetic drugs leading to an ever-emerging set of novel "hard" drug substances. To address this, regulatory bodies are seeking that drug regulations to include generic group definitions. These broad definitions are complex due to the digital nature of the data and require a high level of accuracy.



Quick and accurate determination of tariff codes
 Assigning the proper harmonized tariff system (HTS) code to chemicals is challenging due to the diversity and complexity of chemical compounds. Individual codes are required for each chemical structure even in case of varying large numbers of research-oriented molecules. While there is a standard 4-digit format that specifies category, individual codes extend these codes with additional digits that reflect their own classification rules and tax regulations.

Werner's HTS code
 Organic chemicals | Lactones | Heterocyclic compounds | Aromatic Drugs with oxygen heteroatom(s) only.

Heading	Number	Heading	Sub-heading	Code
2901-2935	30,748	307	477	766
2901-2942	13,441	81	86	109
2901-2942	1,543	31,226	30,336	93,191
2901-2942	481	88	928	287
2901-2942	45,291	481	910,00	7103

Chemaxon's HTS code can be determined easily based on the chemical structure. 2901-2935: Codes must be defined for pharmaceutical substances. 2901-2942: Additional info is required (e.g., vitamins, hormones, antibodies, etc.)

