UNITED STATES
PATENT AND TRADEMARK OFFICE
uspto

The patent examination process: Different approaches to searching at the USPTO

Jackie Cheng
Supervisory Patent Examiner
Technology Center 3700

Sue Liu
Supervisory Patent Examiner
Technology Center 1600

February 2019

UNITED STATES
PATENT AND TRADEMARK OFFICE
uspto

Patent examination process

UNITED STATES
PATENT AND TRADEMARK OFFICE
uspto

What is the role of a patent examiner?

- To protect the public interest with respect to intellectual property
- To provide direct service and assistance to both internal and external USPTO stakeholders
- To examine patentability with respect to invention(s) claimed in a patent application under the conditions for patentability set forth in Title 35 of the United States Code

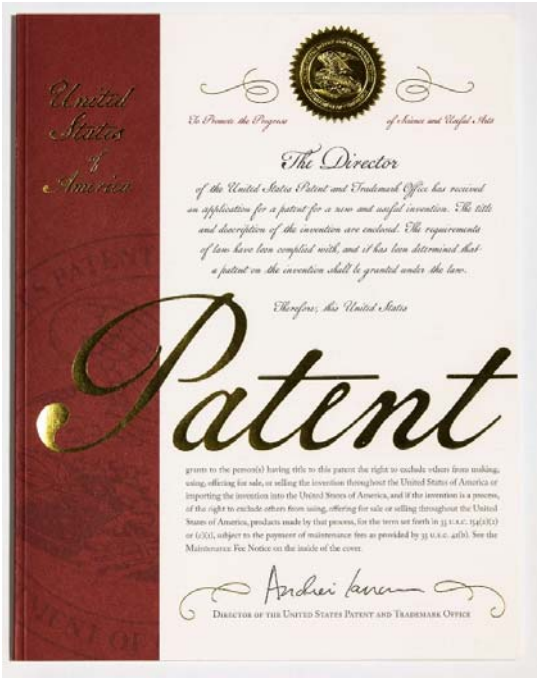
uspto

What does a patent examiner do?

- Reads and understands the invention set forth in the specification
- Determines whether the application is adequate to define the metes and bounds of the claimed invention
- Determines the scope of the claim(s)
- Searches existing technology for claimed invention
- Ensures that all pertinent procedural steps necessary for obtaining a patent are complied with

What does a patent examiner do?

- Determines patentability of the claimed invention
- Provides a response, called an office action, identifying and analyzing all issues pertinent to patentability of the claimed invention
- Issues further office actions in response to applicant replies, as appropriate
- Issues notice of allowance or notice of abandonment



How does an application get to an examiner?

- Patent applications are given a classification based on the subject matter of the application and assigned to the proper technology center (TC) based on this classification.
- Each TC is an organization with various art units within a broad area of mechanical, electrical, chemical, or design, managed by one or more directors.

1600 – Biotechnology and Organic Chemistry
1700 – Chemical and Materials Engineering
2100 – Computer Architecture and Software
2400 – Network, Multiplexing, Cable, Security
2600 – Communications
2800 – Semiconductors/Memory, Optics/Photocopying, Electrical Circuits & Systems and Printing/Measuring & Testing
2900 – Design
3600 – Transportation, Construction, Agriculture, Electronic Commerce and National Security
3700 – Mechanical Engineering, Manufacturing and Medical Devices/Processes

uspto

What electronic tools does an examiner use?

- **Docket and Application Viewer (DAV)**
  - View docket and applications
- **Prior art search tools**
  - Examiner's Automated Search Tool (EAST)
  - Web Examiner Search Tool (WEST)
  - Electronic databases
- **Official Correspondence (OC)**
  - Write up outgoing correspondences to be sent to applicants/applicant's representatives

uspto

Searching

UNITED STATES
PATENT AND TRADEMARK OFFICE
uspto

How are search strategies developed?

- **Claim interpretation**
  - Read and understand the claimed invention
  - Determine the scope of the claimed invention
- **Consultation with other examiners**
- **Review of the cited prior art**
  - Information disclosure statements, 3rd party submissions
- **Review of patent family documents (foreign, domestic)**
- **Review of international search reports (ISR) and written opinions for PCT 371 applications**

uspto

Where do examiners search?

- **U.S. patent databases (e.g. EAST/WEST, Google Patents)**
- **International patent databases (e.g. Espacenet, WIPO)**
- **Online databases (e.g. IEEE, PubMed, CAS, ProQuest, STN)**
- **Internet search engines (e.g. Google, Bing)**
- **Scientific and Technical Information Center (STIC)**
  - Technology-specific, internal USPTO electronic search assistance
- **Anywhere they might find the information they need with evidence of the date of publication or availability**

uspto

Ways to search a patent application

- **Classification search**
  - Looking through all documents in a CPC symbol
  - Most useful for mechanical area

A61B 1/00064	. {Constructional details of the endoscope body}
A61B 1/00066	. . {Proximal part of endoscope body, e.g. handles (A61B 1/0052 takes precedence)}
A61B 1/00068	. . . {Valve switch arrangements}
A61B 1/00071	. . {Insertion part of the endoscope body (A61B 1/0055 takes precedence)}
A61B 1/00073	. . . {with externally grooved shaft}
A61B 1/00075	. . . {with externally roughened shaft}
A61B 1/00078	. . . {with stiffening means}
A61B 1/0008	. . . {characterised by distal tip features}
A61B 1/00082	. . . . {Balloons}
A61B 1/00085	. . . . {Baskets}
A61B 1/00087	. . . . {Tools (A61B 17/00234 takes precedence)}
A61B 1/00089	. . . . {Hoods}
A61B 1/00091	. . . . {Nozzles}
A61B 1/00094	. . . . {Suction openings}
A61B 1/00096	. . . . {Optical elements}
A61B 1/00098	. . . . {Deflecting means for inserted tools}
A61B 1/00101	. . . . {the distal tip features being detachable}

Ways to search a patent application, cont.

- **Classification search limited by text**

  A61B 5/055 (involving electronic [EMR] or nuclear [NMR] magnetic resonance, e.g. magnetic resonance imaging)

  AND

  (fluid with flow) or velocity

Ways to search a patent application, cont.

- **Text-only search**

(eeg or electroencephalogram) and (sleep with stage) and ((night or sleep) with terror)

Ways to search a patent application, cont.

- Information Disclosure Statement (IDS)
- Inventor and assignee searches
- Forward/backward reference search

Search strategies for biotech applications

UNITED STATES
PATENT AND TRADEMARK OFFICE
uspto

Biotech search strategies

- **Biological sequence searches**
  - Public and patent databases
  - DNA and amino acid sequences
- **Chemical compounds and reaction searches**
  - Structure searches
  - Chemical name searches

uspto

USPTO commercial biotech databases

Vendor	Searchable Collection	Comments
STN (Scientific and Technical Information Network) Partners are: - Chemical Abstract Service (CAS) - FIZ Karlsruhe - Japan Association for International Chemical Information (JAICI)	**Contains over 150 databases.** STN databases are accessible through three interfaces: STN Express®, STN® on the Web℠, or STN Easy®. These interfaces are available to examiners via the Patent Examiner's Toolkit. Requires an ID and password. Offers the largest collection of chemical and related information. Databases cover many scientific disciplines, including biomedical science, chemistry, engineering, materials science, pharmaceuticals, and agricultural science. Coverage varies by database. CAplus℠ alone contains more than 40.1 million records which are included in more than 10,000 journals back to early 1800s. STN Catalog (link is external)	**TCs with access:** TC 1600, TC 1700, TC 2100, TC 2400, TC 2600, TC 2800, TC 3600, and TC 3700
ProQuest Dialog Owned by ProQuest	**Contains over 100 databases** ProQuest Dialog's information focus includes business, intellectual property, law, government, news science and technology through more than 1 billion unique records from the world's most authoritative publishers. ProQuest Dialog is available to patent examiners on the Patent Examiner's Toolkit. Requires an ID and password. Patent Examiners also have access by IP authentication to custom collections of content based on their specific Technology Center. ProQuest Dialog (link is external)	**TCs with access:** TC 1600, TC1700, TC2100, TC2400, TC2600, TC2800, TC3600, and TC3700
ABSS databases (Automated Biotechnology Sequence Search System)	**Genetic sequence search system**. The USPTO internal genetic sequence search system composed of commercially available databases such as Genbank/EMBL, Geneseq, PIR, and UniProt. In-house databases (pending applications, issued patents, and published applications (PGPubs)) are also available for interference and prior art purposes. Useful for routine sequence searching as well as specialized searches, including alignments, length-limited, oligomer, and score/length.	**TCs with access:** TC 1600

Sequence searching

- Commercially available vendor at USPTO: ABSS
- Public available searching tools such as NCBI's BLAST
- STN searching smaller sequences and with modified residues
- Applications with biological sequences must comply with the sequence rules and submitting the appropriate CRF (computer readable form)
- The query sequence must have a valid CRF for ABSS searching

uspto

ABSS searchable database content

Peptide databases

Database name	Results file extension	Producer	Source of sequences
A-Geneseq	.rag	Clarivate Analytics https://clarivate.com/wp-content/uploads/2018/03/GENESEQ-Fact-_Sheet2.pdf	Protein sequences extracted from the original (basic) patent documents published by over 40 patent offices worldwide.
PIR	.rpr	National Biomedical Research Foundation	Protein Identification Resource. This database is archival; it is no longer updated.
UNIPROT	.rup	https://www.uniprot.org/	Universal Protein Resource. Central repository of protein and sequence function created by joining the information contained in Swiss-Prot, TrEMBL, and PIR.
PendingAA	.rapm and .rapn	USPTO	Protein sequences from USPTO pending applications.
IssuedAA	.rai	USPTO	Protein sequences from issued US patents. This information may be available in commercial databases.
Published ApplicationsAA	.rapbm and .rapbn	USPTO	Applications published 18 months after receipt by USPTO. Data in this file may be used for a rejection. This information may be available in commercial databases.

ABSS searchable database content

Nucleotide databases

Database name	Results file extension	Producer	Source of sequences
GenEmbl	.rge	National Center for Biotechnology Information https://www.ncbi.nlm.nih.gov/genbank/	An annotated collection of all publicly available DNA sequences. GenBank is part of the International Nucleotide Sequence Database Collaboration, which comprises the DNA DataBank of Japan (DDBJ), the European Molecular Biology Laboratory (EMBL), and GenBank at NCBI. These three organizations exchange data on a daily basis.
EST	.rst	National Center for Biotechnology Information https://www.ncbi.nlm.nih.gov/nucest	Expressed Sequence Tags (EST) and Sequence Tagged Sites (STS) from GenBank.
N-Geneseq	.rng	Clarivate Analytics https://clarivate.com/wp-content/uploads/2018/03/GENESEQ-Fact-Sheet2.pdf	Nucleic acid sequences extracted from the original (basic) patent documents published by over 40 patent offices worldwide.
PendingNA	.rnpm and .rnpn	USPTO	Nucleic acid sequences from USPTO pending applications.
IssuedNA	.rni	USPTO	Nucleic acid sequences from issued US patents. This information may be available in commercial databases.
Published ApplicationsNA	.rnpbm and .rnpbn	USPTO	Applications published 18 months after receipt by USPTO. Data in this file may be used for a rejection. This information may be available in commercial databases.

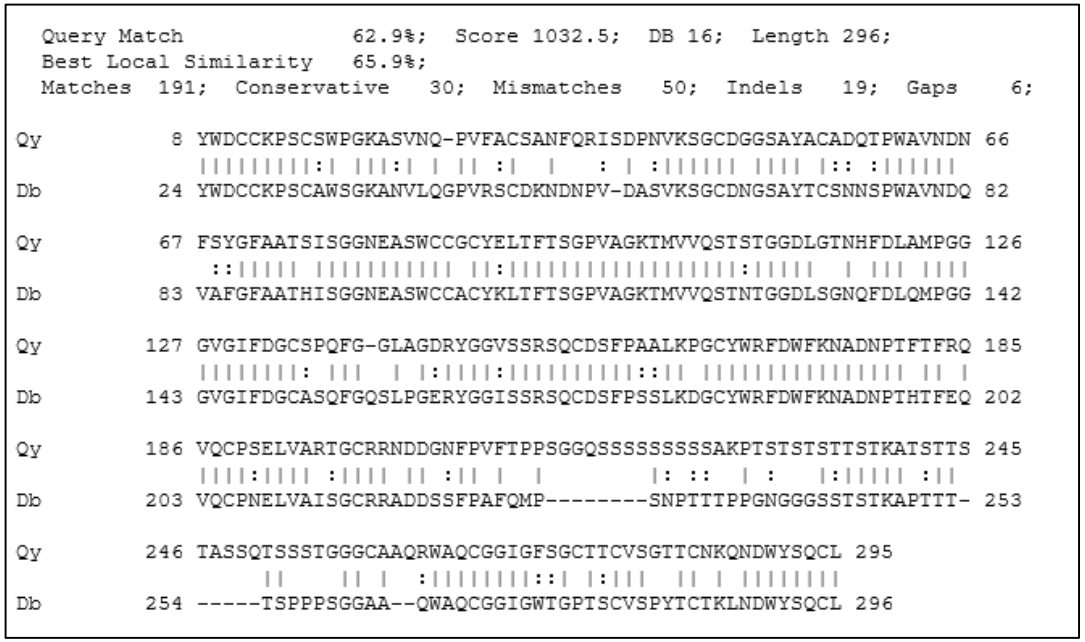
Types of alignments

- Default: one-to-one using Smith-Waterman algorithm showing best local similarity
- Multi-sequence: multiple sequences in a single alignment plot using CLUSTAL W algorithm (Jemboss Emma)
- Global: one-to-one global alignment using Needleman-Wunsch algorithm (Jemboss Needle)

uspto

Types of alignments: default

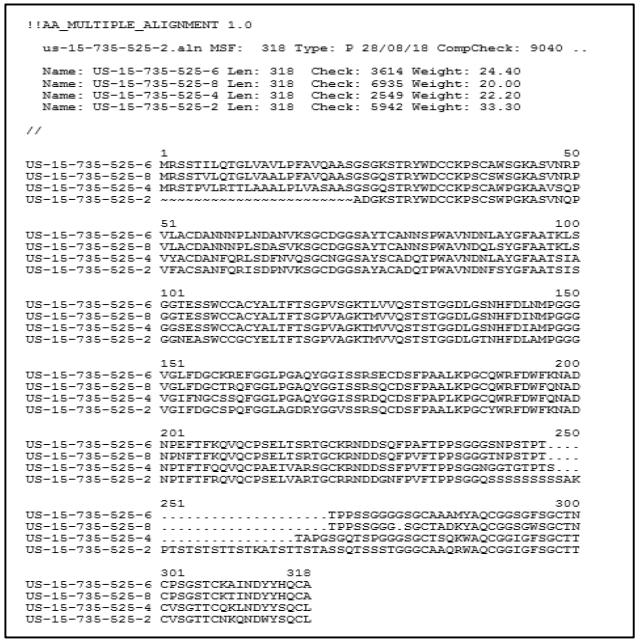
- Default: one-to-one using Smith-Waterman algorithm showing best local similarity



```
  Query Match             62.9%;  Score 1032.5;  DB 16;  Length 296;
  Best Local Similarity   65.9%;
  Matches  191;  Conservative   30;  Mismatches   50;  Indels   19;  Gaps    6;

Qy          8 YWDCCKPSCSWPGKASVNQ-PVFACSANFQRISDPNVKSGCDGGSAYACADQTPWAVNDN 66
              |||||||||:| |||:| | || :|  |   : | :|||||| |||| |:: :|||||| 
Db         24 YWDCCKPSCAWSGKANVLQGPVRSCDKNDNPV-DASVKSGCDNGSAYTCSNNSPWAVNDQ 82

Qy         67 FSYGFAATSISGGNEASWCCGCYELTFTSGPVAGKTMVVQSTSTGGDLGTNHFDLAMPGG 126
               ::||||| |||||||||| ||:||||||||||||||||||:|||||  | ||| |||| 
Db         83 VAFGFAATHISGGNEASWCCACYKLTFTSGPVAGKTMVVQSTNTGGDLSGNQFDLQMPGG 142

Qy        127 GVGIFDGCSPQFG-GLAGDRYGGVSSRSQCDSFPAALKPGCYWRFDWFKNADNPTFTFRQ 185
              ||||||||: |||  | |:||||:||||||||||::|| |||||||||||||||| || | 
Db        143 GVGIFDGCASQFGQSLPGERYGGISSRSQCDSFPSSLKDGCYWRFDWFKNADNPTHTFEQ 202

Qy        186 VQCPSELVARTGCRRNDDGNFPVFTPPSGGQSSSSSSSSSAKPTSTSTSTTSTKATSTTS 245
              ||||:|||| :|||| || :|| |  |        |: ::  | :   |:|||||| :|| 
Db        203 VQCPNELVAISGCRRADDSSFPAFQMP--------SNPTTTPPGNGGGSSTSTKAPTTT- 253

Qy        246 TASSQTSSSTGGGCAAQRWAQCGGIGFSGCTTCVSGTTCNKQNDWYSQCL 295
                    ||    || |  :||||||||::| |:|||  || | ||||||||
Db        254 -----TSPPPSGGAA--QWAQCGGIGWTGPTSCVSPYTCTKLNDWYSQCL 296
```

Types of alignments: multi-sequence

- Multi-sequence: multiple sequences in a single alignment plot using CLUSTAL W algorithm (Jemboss Emma)



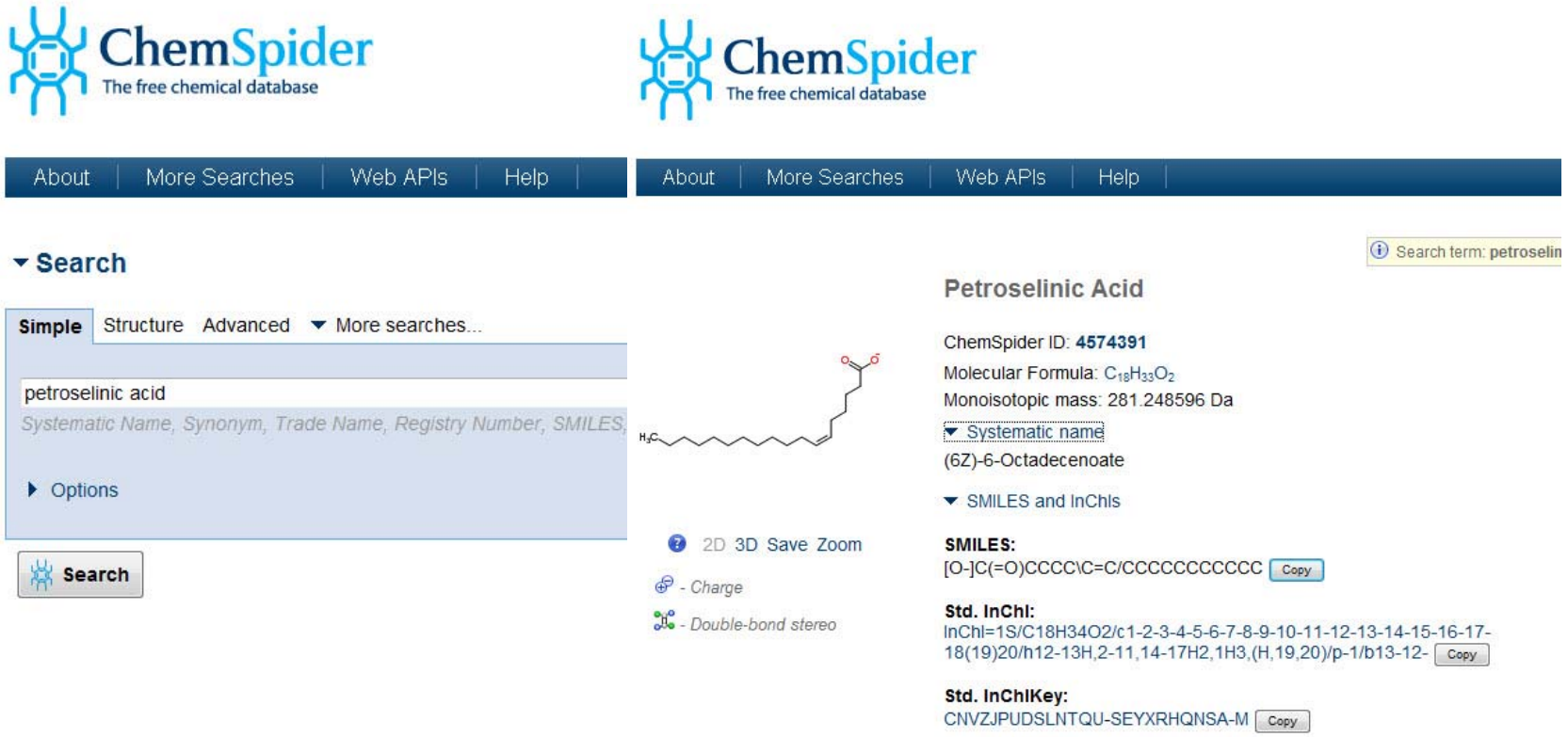
```
!!AA_MULTIPLE_ALIGNMENT 1.0

  us-15-735-525-2.aln MSF:  318 Type: P 28/08/18 CompCheck: 9040 ..

  Name: US-15-735-525-6 Len: 318  Check: 3614 Weight: 24.40
  Name: US-15-735-525-8 Len: 318  Check: 6935 Weight: 20.00
  Name: US-15-735-525-4 Len: 318  Check: 2549 Weight: 22.20
  Name: US-15-735-525-2 Len: 318  Check: 5942 Weight: 33.30

//

                1                                                    50
US-15-735-525-6 MRSSTILQTGLVAVLPFAVQAASGSGKSTRYWDCCKPSCAWSGKASVNRP
US-15-735-525-8 MRSSTVLQTGLVAALPFAVQAASGSGQSTRYWDCCKPSCSWSGKASVNRP
US-15-735-525-4 MRSTFVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQP
US-15-735-525-2 ~~~~~~~~~~~~~~~~~~~~~~ADGKSTRYWDCCKPSCSWPGKASVNQP

                51                                                   100
US-15-735-525-6 VLACDANNNPLNDANVKSGCDGGSAYTCANNSPWAVNDNLAYGFAATKLS
US-15-735-525-8 VLACDANNNPLSDASVKSGCDGGSAYTCANNSPWAVNDQLSYGFAATKLS
US-15-735-525-4 VYACDANFQRLSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIA
US-15-735-525-2 VFACSANFQRISDPNVKSGCDGGSAYACADQTPWAVNDNFSYGFAATSIS

                101                                                  150
US-15-735-525-6 GGTESSWCCACYALTFTSGPVSGKTLVVQSTSTGGDLGSNHFDLNMPGGG
US-15-735-525-8 GGTESSWCCACYALTFTSGPVAGKTMVVQSTSTGGDLGSNHFDINMPGGG
US-15-735-525-4 GGSESSWCCACYALTFTSGPVAGKTMVVQSTSTGGDLGSNHFDIAMPGGG
US-15-735-525-2 GGNEASWCCGCYELTFTSGPVAGKTMVVQSTSTGGDLGTNHFDLAMPGGG

                151                                                  200
US-15-735-525-6 VGLFDGCKREFGGLPGAQYGGISSRSECDSFPAALKPGCQWRFDWFKNAD
US-15-735-525-8 VGLFDGCTRQFGGLPGAQYGGISSRSQCDSFPAALKPGCQWRFDWFQNAD
US-15-735-525-4 VGIFNGCSSQFGGLPGAQYGGISSRSDQCDSFPAPLKPGCQWRFDWFQNAD
US-15-735-525-2 VGIFDGCSPQFGGLAGDRYGGVSSRSQCDSFPAALKPGCYWRFDWFKNAD

                201                                                  250
US-15-735-525-6 NPEFTFKQVQCPSELTSRTGCKRNDDSQFPAFTPPSGGGSNPSTPT....
US-15-735-525-8 NPNFTFKQVQCPSELTSRTGCKRNDDSQFPVFTPPSGGGTNPSTPT....
US-15-735-525-4 NPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGGNGGTGTPTS...
US-15-735-525-2 NPTFTFRQVQCPSELVARTGCRRNDDGNFPVFTPPSGGQSSSSSSSSAK

                251                                                  300
US-15-735-525-6 ..................TPPSSGGGGSGCAAAMYAQCGGSGFSGCTN
US-15-735-525-8 ..................TPPSSGGG.SGCTADKYAQCGGSGWSGCTN
US-15-735-525-4 ..................TAPGSGQTSPGGGSGCTSQKWAQCGGIGFSGCTT
US-15-735-525-2 PTSTSTSTTSTKATSTTSTASSQTSSSTGGGCAAQRWAQCGGIGFSGCTT

                301          318
US-15-735-525-6 CPSGSTCKAINDYYHQCA
US-15-735-525-8 CPSGSTCKTINDYYHQCA
US-15-735-525-4 CVSGTTCQKLNDYYSQCL
US-15-735-525-2 CVSGTTCNKQNDWYSQCL
```

Chemical structure searches

- Chemical name search (text searching)
- Chemical compound structure search
- Chemical reaction search
- Patent and non-patent databases

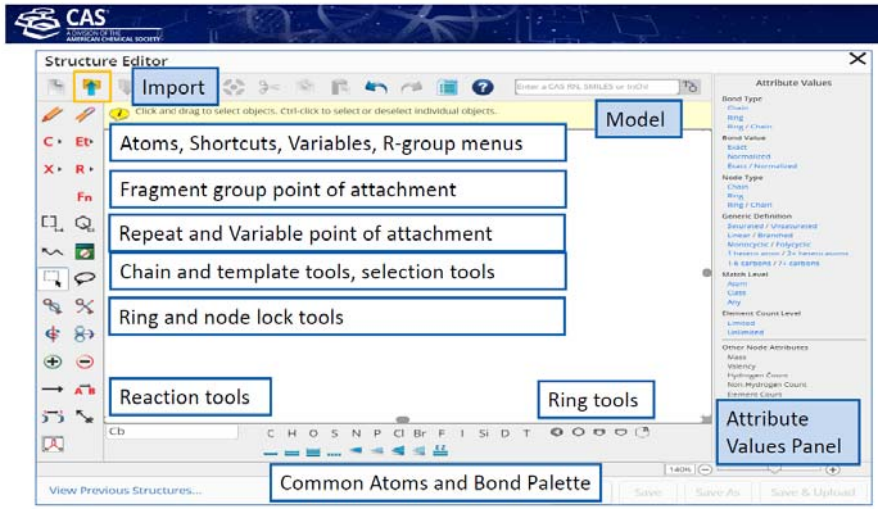
uspto

Example of text searching using Royal Society of Chemistry (RSC)

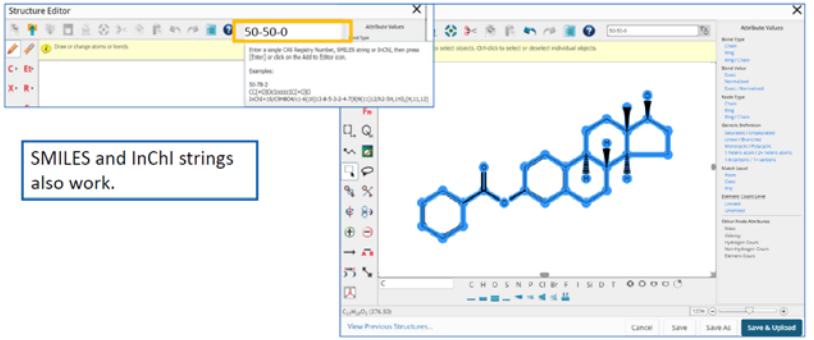


http://www.chemspider.com

Example of chemical structure search using STNext



Structures can be modeled directly from CAS Registry Number® identifiers via **Add to Editor** tool

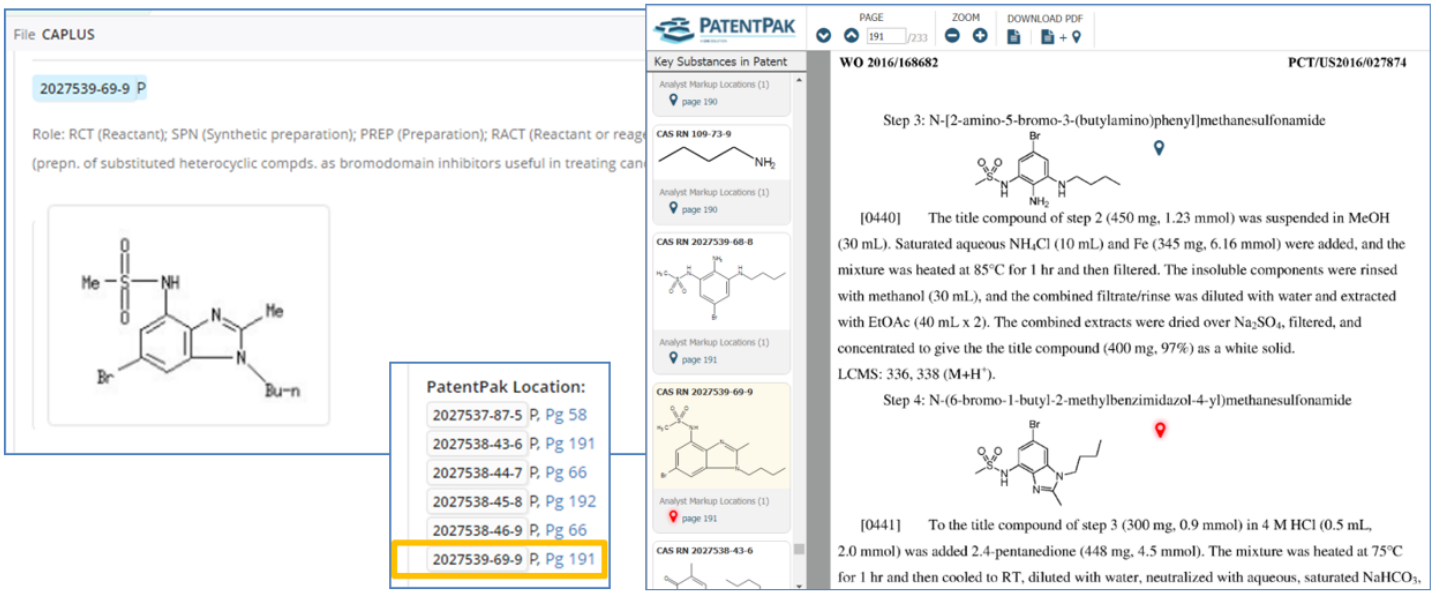


SMILES and InChI strings also work.

STNext at next.stn.org

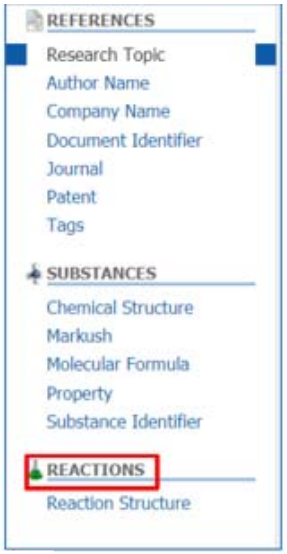
Results of chemical structure search using STNext

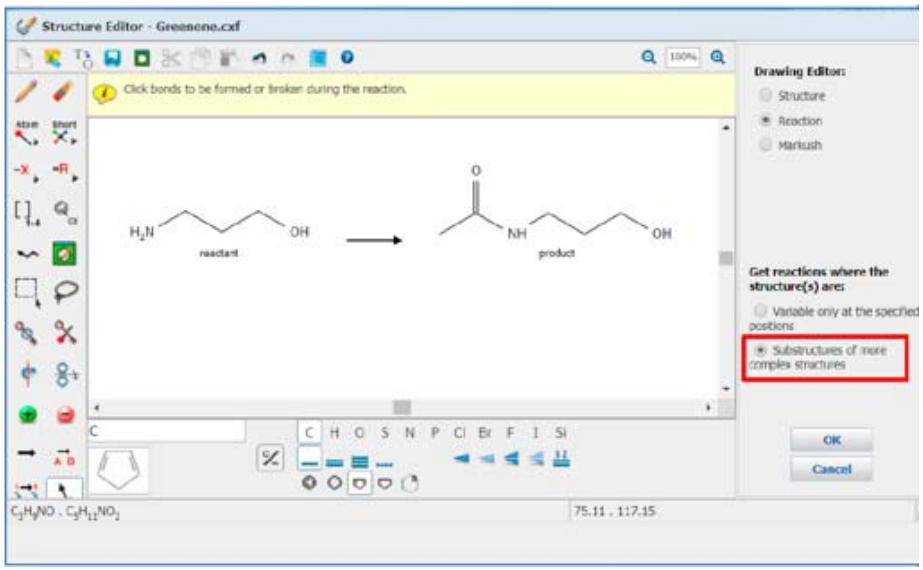
- HITPPAK displays direct links to substances in the original patent publication (e.g. D HITSTR HITPPAK)



Example of chemical reaction searching using Scifinder

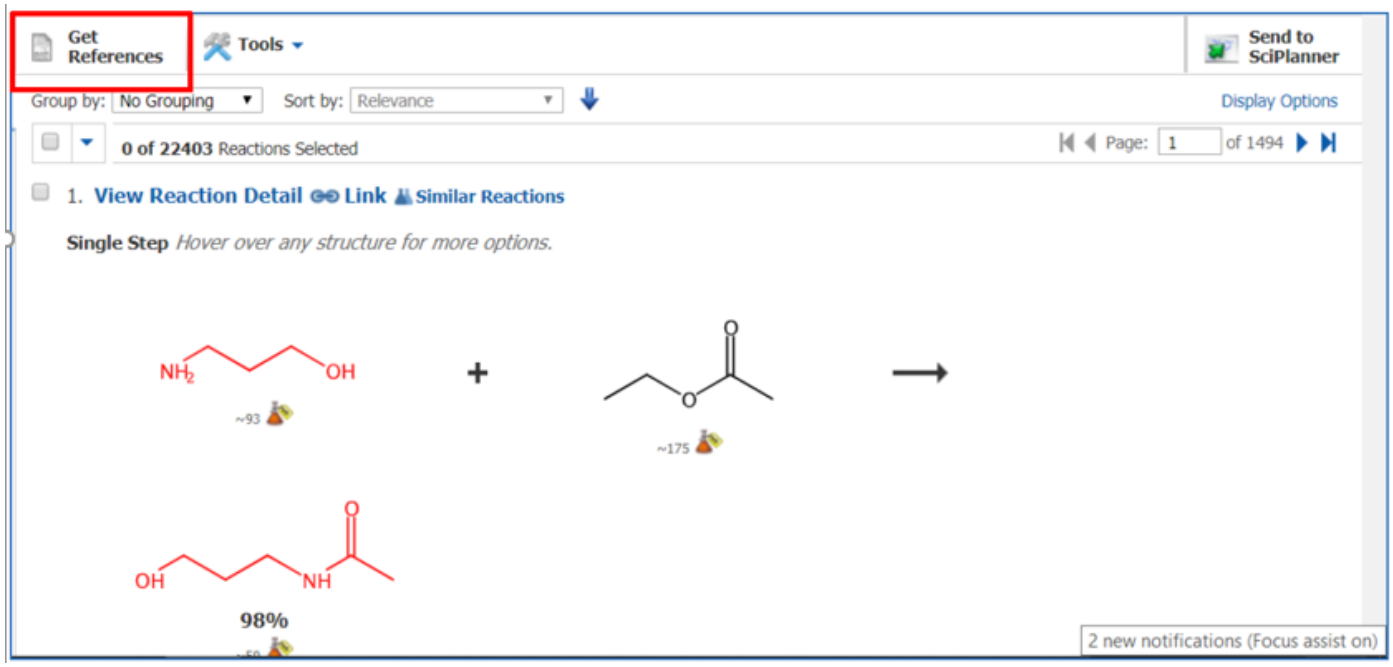
Search Reaction option and create strategy in structure editor and save as substructure option





Example of chemical reaction searching using Scifinder

View Reaction answers and Get References



So… what is the best way to search?

- **There is no best way.**
- **Search strategy depends on:**
  - technology
  - claims themselves
  - examiner expertise
  - combination of techniques

uspto

Questions?

Thank you!

UNITED STATES PATENT AND TRADEMARK OFFICE
DEPARTMENT OF COMMERCE