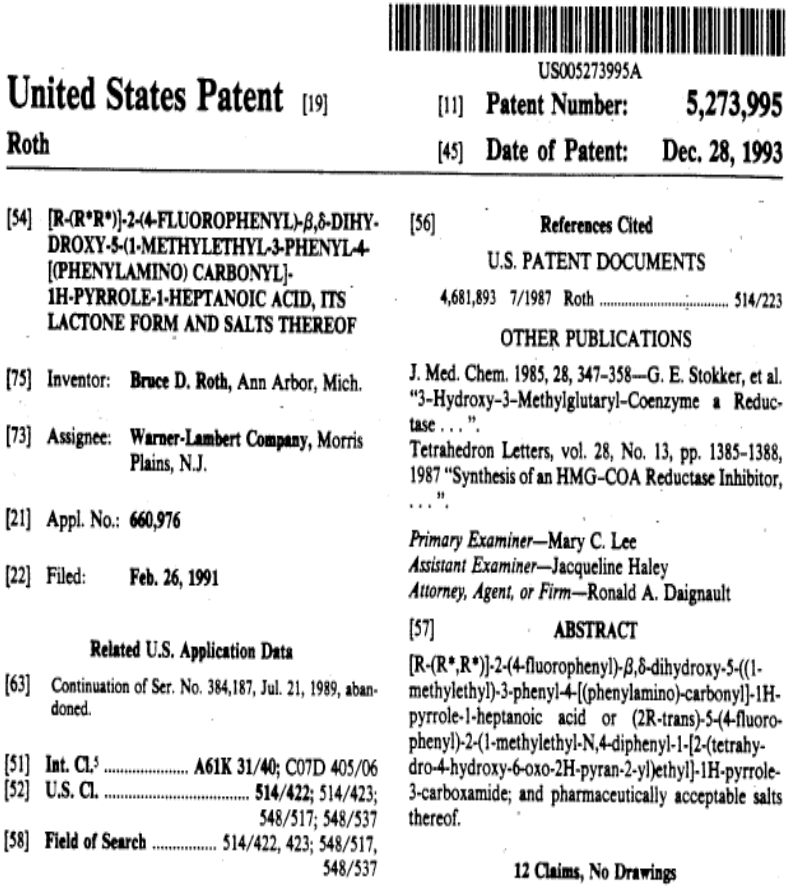
Pfizerpedia Patents – The Who, what when and why of patents

David Walsh, Andrew Berridge, RDMi, Pfizer, Sandwich

Worldwide Technology
R&D Informatics

- Lipitor patent
- The best selling US prescription medicine



US005273995A

United States Patent [19]

Roth

[11] **Patent Number: 5,273,995**

[45] **Date of Patent: Dec. 28, 1993**

[54] **[R-(R*R*)]-2-(4-FLUOROPHENYL)-β,δ-DIHYDROXY-5-(1-METHYLETHYL-3-PHENYL-4-[(PHENYLAMINO) CARBONYL]-1H-PYRROLE-1-HEPTANOIC ACID, ITS LACTONE FORM AND SALTS THEREOF**

[75] Inventor: **Bruce D. Roth**, Ann Arbor, Mich.

[73] Assignee: **Warner-Lambert Company**, Morris Plains, N.J.

[21] Appl. No.: **660,976**

[22] Filed: **Feb. 26, 1991**

Related U.S. Application Data

[63] Continuation of Ser. No. 384,187, Jul. 21, 1989, abandoned.

[51] **Int. Cl.**[5] **A61K 31/40**; C07D 405/06

[52] **U.S. Cl.** **514/422**; 514/423; 548/517; 548/537

[58] **Field of Search** 514/422, 423; 548/517, 548/537

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,681,893 7/1987 Roth 514/223

OTHER PUBLICATIONS

J. Med. Chem. 1985, 28, 347-358—G. E. Stokker, et al. "3-Hydroxy-3-Methylglutaryl-Coenzyme a Reductase . . . ".

Tetrahedron Letters, vol. 28, No. 13, pp. 1385-1388, 1987 "Synthesis of an HMG-COA Reductase Inhibitor, . . . ".

Primary Examiner—Mary C. Lee
Assistant Examiner—Jacqueline Haley
Attorney, Agent, or Firm—Ronald A. Daignault

[57] **ABSTRACT**

[R-(R*,R*)]-2-(4-fluorophenyl)-β,δ-dihydroxy-5-((1-methylethyl)-3-phenyl-4-[(phenylamino)-carbonyl]-1H-pyrrole-1-heptanoic acid or (2R-trans)-5-(4-fluorophenyl)-2-(1-methylethyl-N,4-diphenyl-1-[2-(tetrahydro-4-hydroxy-6-oxo-2H-pyran-2-yl)ethyl]-1H-pyrrole-3-carboxamide; and pharmaceutically acceptable salts thereof.

12 Claims, No Drawings

Many processes in Research and commercial activities require us to monitor patents

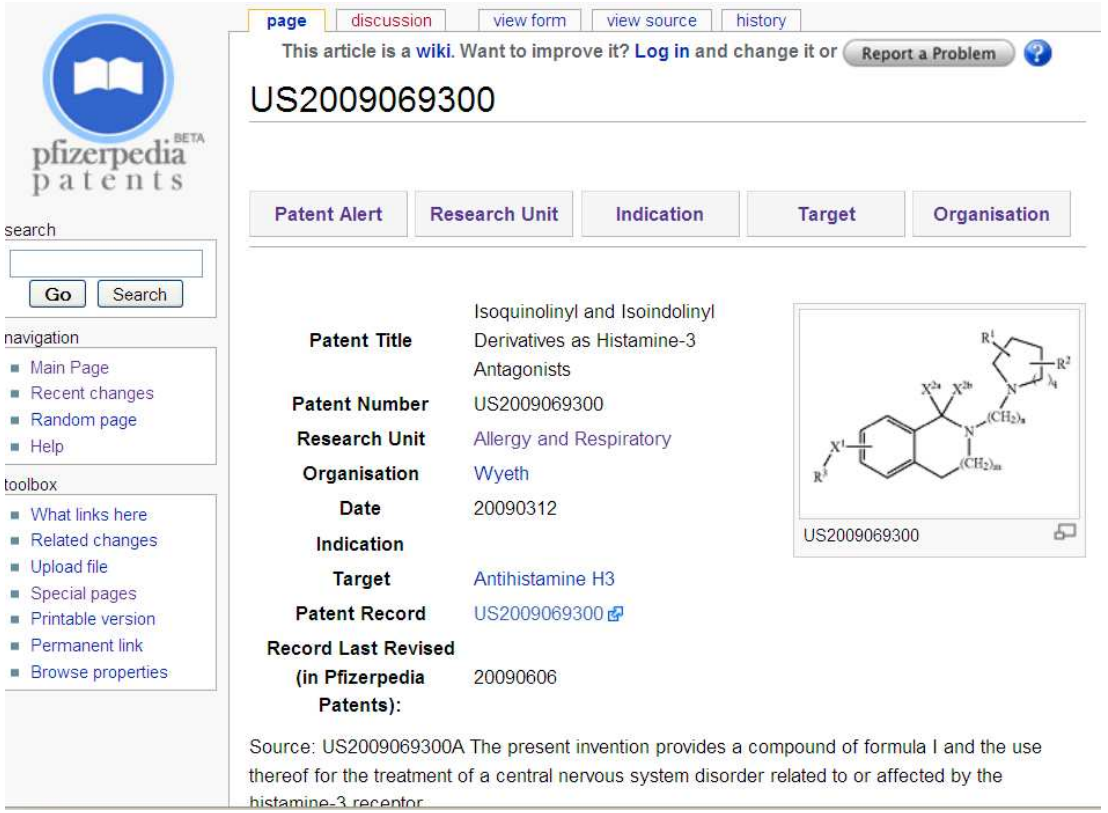
- Serendipity
- Competitor Intelligence
- Target Validation
- Lead Discovery
- Indications Discovery

Serendipity ?

is the effect by which one accidentally discovers something fortunate, *especially* while looking for something else entirely unrelated.

Pfizerpedia Patents

- Alerting in Pfizer
- Requirements
- Problems with Excel
- Semantic MediaWiki
- Future Prospects
- Conclusions



Alerting processes in Pfizer

- Scifinder
- WebAlerts derived from Derwent WDA +
- Sandwich Patent alerting system

Sandwich Patent Alerting System, 2002 to date

- Sandwich Patent alerting system

  - Much more intervention and selection; the need to be agile and report only on relevant patents; but have room to identify really new patents on new targets, new processes.

  - Derived originally from USPTO, EP, WO websites,
    - then Micropatent
    - and then Patbase

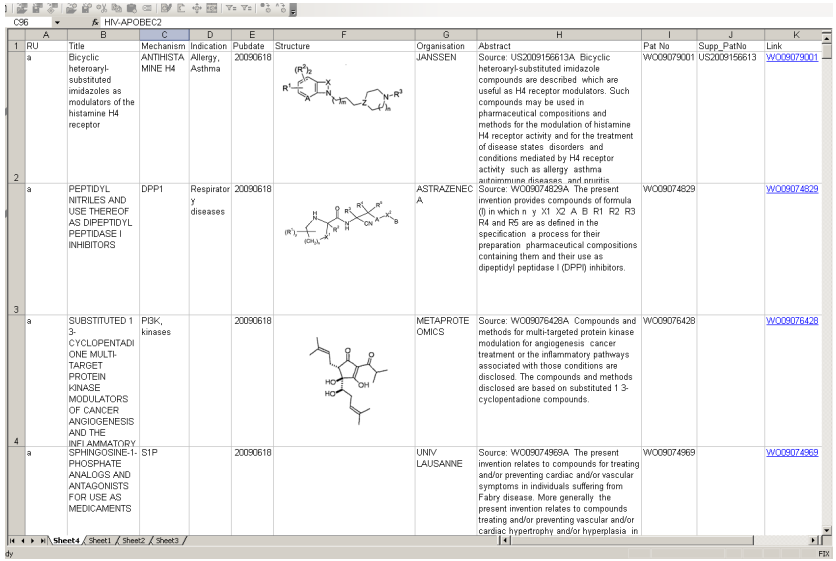
  - Alerts processed from Patbase export of XML, followed by processing using Pipeline Pilot to remove all but the essential data, and generated as Excel file

  - Structures selected and clipped manually from original patent document pdf; best description of invention

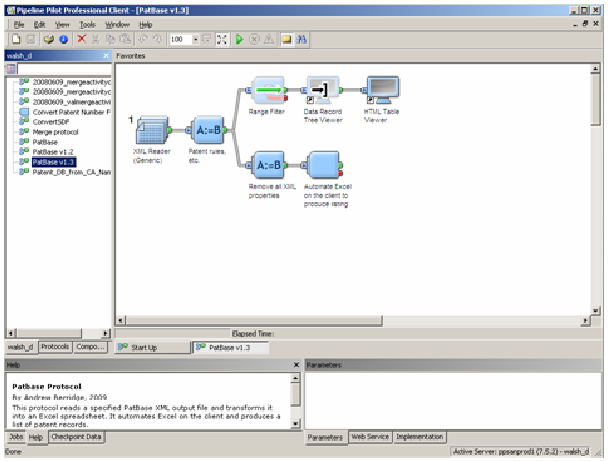
Sandwich Patent Alerting Excel file

Conversion of XML

To Excel Sheet: Parsimony Curation



Via Pipeline Pilot



Worldwide Technology
R&D Informatics

- Need to update a manual patent alert in Excel
  - Need to generate a Target based patent portfolio database
  - Minimal disruption to users
  - Need to have chemical structures
  - Need to provide RSS feeds
  - Need to have consistent Target identity, Organisations and indications
  - Need to provide links to full text of patents
  - Web based service

Needs requirements - client side

- Need to be informed quickly about new patents
- Require chemical structures to assess relevance
- Needs to be flexible according to changes in research portfolio
- Needs to identify new targets to allow serendipity

Problems with Excel

- Floating structures
- No sorting facility
- No searching facility
- Alert becomes ephemeral very quickly and is not re-used
- Difficult to generate a database with structure images

Why do patent alerting this way?

- Close relationship between selected patents and project goals
- Flexible to changes in project portfolio
- Allows finding really new targets by inbuilt serendipity based on broad strategies and analysis of competitor companies.

- Generates a “database” without requiring development of a custom software solution
- Little requirement for external programming
- High speed prototyping and development
- Provides hyperlinking of all major fields; very flexible
- Originally considered as a means to present competitor intelligence charts, but as this data may change cell by cell, patent alerting was regarded as a simpler option.
- Can be queried by external applications

- MediaWiki – as used by Wikipedia.org…

- …but with “Semantic” extension:
  - Wiki pages have well-defined “Properties”
  - Wiki can be queried for values of the properties
  - Gives “click-through” capability for all properties on a page
- Example – “Patent record page” has properties:
  - Patent number
  - Organisation (patentee, or inventor)
  - Chemical structure
  - Date
  - Pfizer research unit
  - Target (what part of the body system does this patent influence?)
  - Indication (what disease does this patent treat?)

Semantic?

- Fits requirement – Wiki “knows” about its data. The text knows what it is. It’s not just a load of unstructured information. It begins to have structure and meaning
- I have a dream for the Web [in which computers] become capable of analyzing all the data on the Web – the content, links, and transactions between people and computers. A ‘Semantic Web’, which should make this possible, has yet to emerge, but when it does, the day-to-day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines. The ‘intelligent agents’ people have touted for ages will finally materialize.
  - – *Tim Berners-Lee, 1999*

Tim Berners-Lee (2009)

Photo: Enrique Dans

Pfizerpedia Patents

EP1909102 - Pfizerpedia Patents - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://pfizerpediapatents/pfizerpediapatents/index.php/EP1909102

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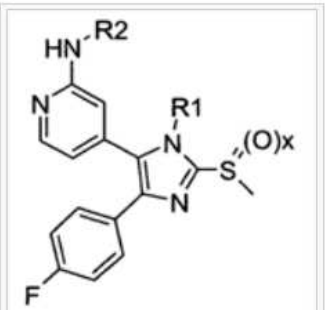
EP1909102

Patent Alert | Research Unit | Indication | Target | Organisation

Patent Title	Method for Subgroup Analysis in Subjects Having or Being Suspected of Having Inflammatory Disease Use of Anti-p38mapk Antibodies Kits and Their Use
Patent Number	EP1909102
Research Unit	Allergy and Respiratory
Organisation	C a I R Biosciences GmbH
Date	20080420
Indication	
Target	P38 MAP Kinase
Patent Record	EP1909102
Record Last Revised (in Pfizerpedia Patents):	20090606



EP1909102

Source: EP1909102A The present invention relates to a method of determining whether a subject having or suspected of having inflammatory disease may potentially benefit from treatment with a p38 mitogen-activated

Done

By Research Unit

search

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navigation

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toolbox

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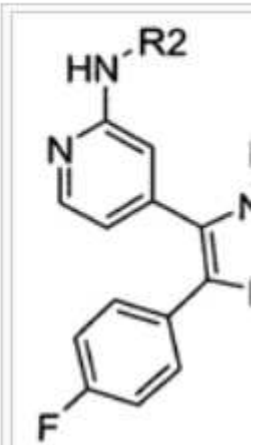
Patent Title	Method for Subgroup Analysis in Subjects Having or Being Suspected of Having Inflammatory Disease Use of Anti-p38mapk Antibodies Kits and Their Use
Patent Number	EP1909102
Research Unit	Allergy and Respiratory
Organisation	C a l Biosciences GmbH
Date	2[illegible]
Indication	
Target	P38 Kinase
Patent Record	EP1909102
Record Last Revised (in Pfizerpedia Patents):	20090606



EP1909102

Source: EP1909102A The present invention relates to a method of determining whether a subject h

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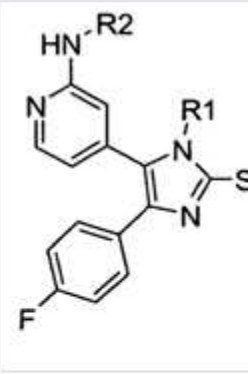
By Research Unit (2)

RSS Feed: Allergy and Respiratory published in last 6 months newsgator

RSS Feed: Allergy and Respiratory uploaded or revised in last 6 months newsgator

LOOK! RSS

Patent Alerts:

Patent Number	Research Unit	Organisation	Title	Date	Target	Indication	Structure Clipping
CN101332204	**Allergy and Respiratory**	Junan Shuaihua Medicine	Anticancer Composition Containing Phosphoinositide 3-kinase Inhibitor and Topology Enzyme Inhibitor	31 December 2008	PI3K		Image:CN101332204.
EP1909102	**Allergy and Respiratory**	C a l R Biosciences GmbH	Method for Subgroup Analysis in Subjects Having or Being Suspected of Having Inflammatory Disease Use of Anti-p38mapk Antibodies Kits and Their Use	20 April 2008	P38 MAP Kinase		
EP2011490	**Allergy and Respiratory**	Sanofi Aventis	Beta Adrenergic Receptor Ligand Derivatives for Modulating Apoptosis		Beta 3		Image:EP2011490.pn
EP2020412	**Allergy and Respiratory**	Cellzome	Sulphur Containing Amino Pyrimidine	4 February 2009	Antihistamine H4		

By Target

arch	Organisation	Title	Date	Target	Indicatior
and atory	Junan Shuaihua Medicine	Anticancer Composition Containing Phosphoinositide 3-kinase Inhibitor and Topology Enzyme Inhibitor	31 December 2008	PI3K	
and atory	C a l R Biosciences GmbH	Method for Subgroup Analysis in Subjects Having or Being Suspected of Having Inflammatory Disease Use of Anti-p38mapk Antibodies Kits and Their Use	20 April 2008	P38 MAP Kinase	

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R&D Informatics

By Target (2)

RSS Feed: PI3K published in last 6 months

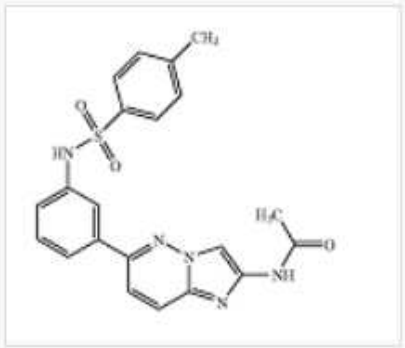
RSS Feed: PI3K uploaded or revised in last 6 months

Patent Alerts:

Patent Number	Organisation	Target	Title	Date	Indication	RU	
CN101332204	Junan Shuaihua Medicine	PI3K	Anticancer Composition Containing Phosphoinositide 3-kinase Inhibitor and Topology Enzyme Inhibitor	31 December 2008		Allergy and Respiratory	Ir
IN01572MU2007	Nycomed	PI3K	Novel Fused Pyrimidines	29 May 2009		Allergy and Respiratory	Ir
US2008085271	Univ Wisconsin	PI3K	Methods of Preventing or Treating Cell-migration Mediated Conditions or Diseases	30 December 2004		Allergy and Respiratory	Ir
US2009098086	Wyeth	PI3K	Thienopyrimidine and Pyrazolopyrimidine Compounds and Their	16 April 2009		Allergy and Respiratory	

- Each patent record has a series of “Properties” or “Facts”

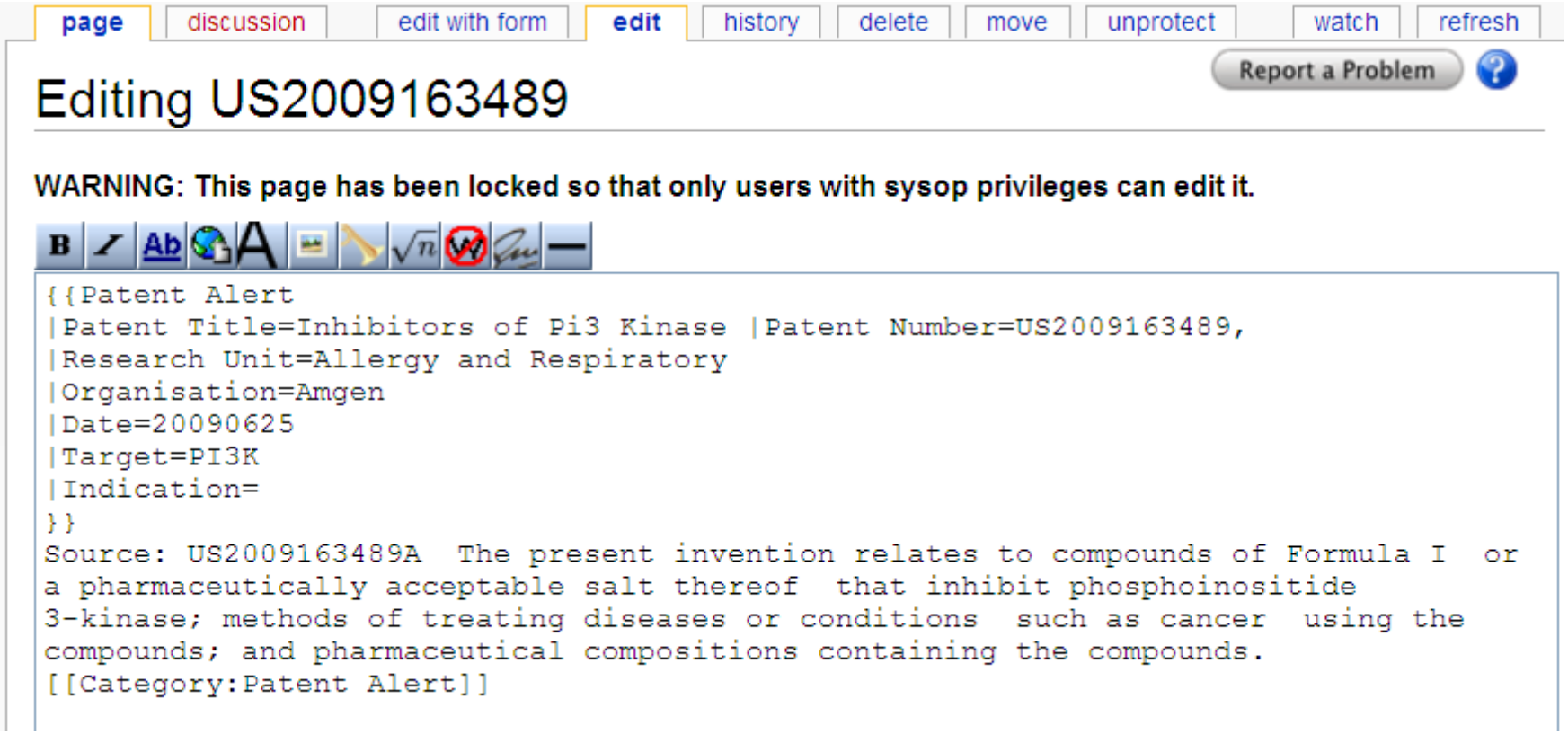
Facts about US2009163489 RDF feed

Date	25 June 2009 +
Last Revised	16 July 2009 +
Organisation	Amgen +
Patent Number	US2009163489 +
Patent Title	Inhibitors of Pi3 Kinase +
Research Unit	Allergy and Respiratory +
Structure Clipping	 +
Target	PI3K +

Category: Patent Alert

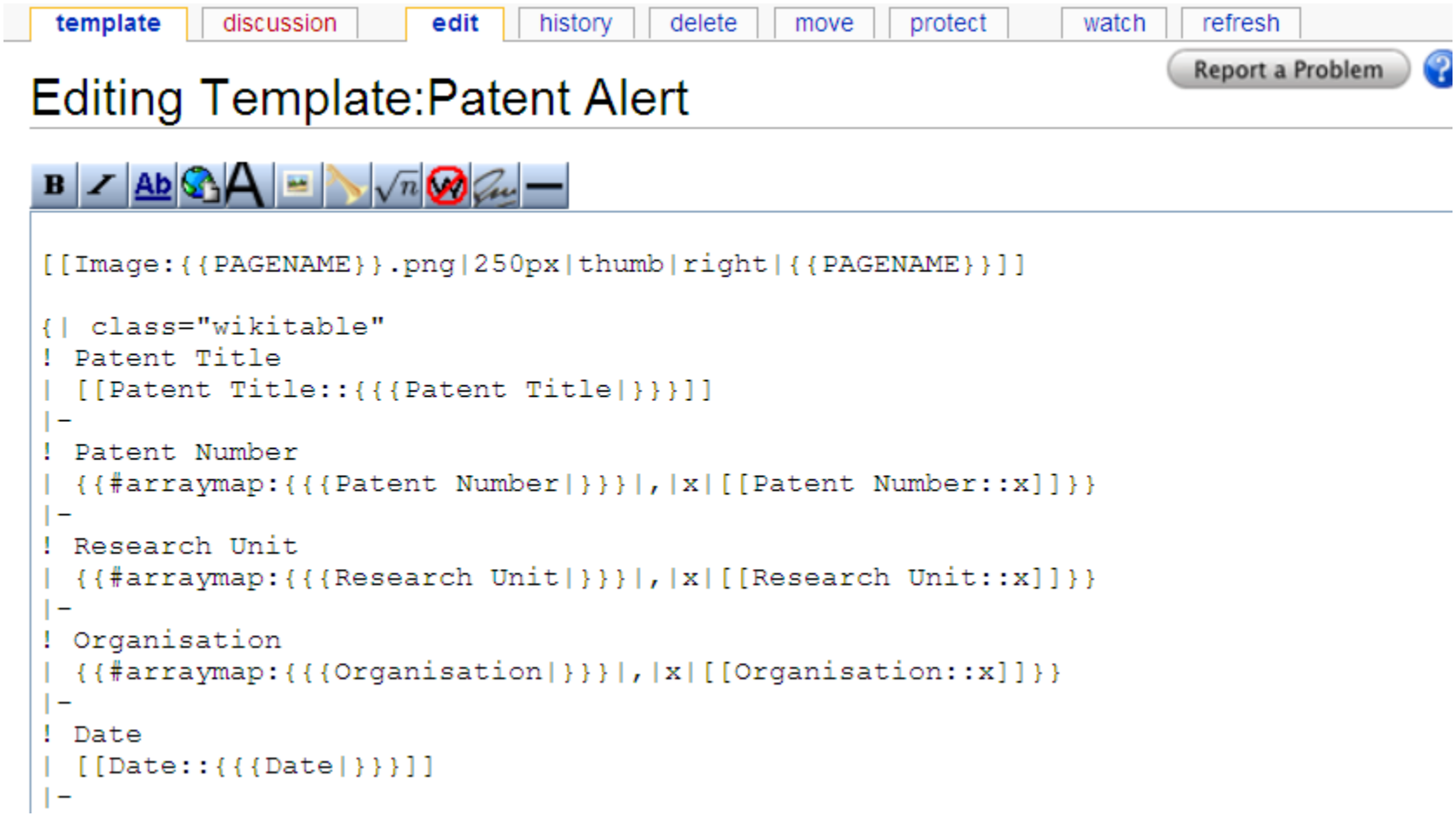
How is this Driven? (2)

- These facts are specified in a template



How is this Driven? (3)

- The template transforms these into properties



- The “#ask” query:
  - Tell me all the pages in the Patent Alert category that have this research unit as a property:

    {{#ask: [[Category:Patent Alert]] [[Research Unit:: {{PAGENAME}}]]
  - Now tell me all these things about the patents found:

    | mainLabel=Patent Number
    | ?Research Unit
    | ?Organisation=Organisation
    | ?Patent Title=Title
    | ?Date=Date
    | ?Target=Target
    | ?Indication=Indication
    | ?Structure Clipping=Structure Clipping
    }}

Technical hurdles overcome

- MediaWiki is best hosted in Apache/MySQL/PHP environment
- MediaWiki
- Import of data from Excel spreadsheets:
  - Excel Macro extracts images from spreadsheet
  - Python script on MediaWiki server reads spreadsheets (in .csv format) and creates the patent record pages in the wiki
  - Structures converted, en masse, using Microsoft Office Picture Manager
- Business Analysis
  - “Flexible indexing of Target”
  - No control over XML data - ?
  - Lots of data requires normalisation; lot of rules;inconsistency in legacy data

User Feedback

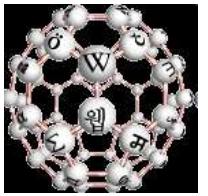
- Scientists like it – provides a flexible environment for viewing alerts
- I like it – easy to work with – to see the entire collection of patent alerts
- Uses new technology that is quickly prototyped
- Database is flexible, indexing is simple, does not include additional “toxic information”
- Allows linking to full text patent documents
- Copyright neutral
- Integrates processing into a single process for alerts and retrospective searches.

Future prospects

- Addition of structure data files to provide live structures
- Backfile already available for two years, but data available for six years
- Patent Project databases for important targets can be backfilled using the same processes as the alerting system
- XML -> Pipeline Pilot -> curation of targets and structures -> MediaWiki processing -> project database
- Concordance of Pfizer ontologies to make compatible with literature based databases
- Standardisation of data within the wiki – constructing an ontology based on standard “preferred terms”
- Going global – entire Pfizer patent alerting using the same process.

Acknowledgements

- Pfizerpedia Patents
- Semantic Media Wiki software available from:
- http://semantic-mediawiki.org/wiki/Semantic_MediaWiki



- Scitegic Accelrys Pipeline Pilot

accelrys

- Patbase (RWS Group, Minesoft)

PatBase

RWS Group minesoft

And Finally!

just because I don't know the meaning of my art, does not mean it has no meaning..." ***Salvador Dali***