IBM Watson for Drug Discovery empowers life sciences researchers to identify hidden patterns and connections as well as develop evidence-based predictive models from diverse, unstructured data sources at a scale and speed that is beyond what humans can do today.

**At a glance**

IBM Watson™ for Drug Discovery core capabilities:

- Aggregated, diverse content: Synthesizes massive public and published data sets, and has the ability to ingest private content (in a private instance).
- Domain understanding: Knowledge of the terms of the language of life sciences, such as genes, drugs, diseases, and the relationships between them.
- Cognitive technology: Leverages machine learning and natural language processing to detect connections and patterns that humans may not necessarily see. Organizations can apply predictive analytics to accelerate hypothesis generation and prioritization.
- Agility and speed: Generates holistic network maps in real time to foster innovative research insights. Watson™ for Drug Discovery is always up-to-date and can quickly evaluate millions of pages of text through machine curation. Watson for Drug Discovery utilizes an adaptive and agile architecture that can change rapidly and iteratively.
- Scalability: Combines infrastructure, big data, and machine learning at a scale that supports the needs of large enterprises.

Additional value for life sciences organizations:

- Can help increase R&D efficiency: Drives more informed selection of potential therapy candidates and helps optimize portfolio management by enabling the organization to make more informed decisions regarding their portfolio.
- Helps accelerate insight generation: Identifies hidden patterns and connections as well as develops evidence-based predictive models from diverse, unstructured data sources at a scale difficult for humans to undertake.
- Can help increase researcher productivity: Accelerates the investigation of hypotheses and identification of novel ideas to augment productivity and output, creating potential for reduced time to market.

**Overview**
Watson for Drug Discovery is a cloud-based, cognitive solution that provides dynamic visualizations and ranked predictions backed by passage-level evidence drawn from a wide set of heterogeneous public and private content, such as medical journal articles, textbooks, and patents.

Watson for Drug Discovery empowers life sciences researchers to identify hidden patterns and connections as well as develop evidence-based predictive models from diverse, unstructured data sources at a scale and speed that is beyond what humans can do today.

**Key prerequisites**

- Internet connection
- Browser

**Planned availability date**

August 31, 2016

**Description**

Value of the cognitive computing capabilities of Watson for Drug Discovery:

- Cognitive capabilities mean the knowledge base grows, allowing researchers to get more insights as the knowledge base grows.
- Unlike a regular Google search that is based on keyword matching that returns a list of websites for the researcher to mine through on their own, Watson for Drug Discovery pulls out the relevant content and shows why that content is relevant.
- As the technology continues to develop, the system can be trained to filter by more detailed and specific concepts.

**Related concepts**

- Watson for Drug Discovery is more than keyword matching; it captures the different names of targets.
- Watson for Drug Discovery understands relationships between entities and can understand different words that have the same meaning.

**Predictive analytics**

- The challenge in drug research and discovery is finding more entities with a certain property. Watson for Drug Discovery goes beyond the existing training set to look at the content.
- Reasoning analysis helps rank the entities closest to the set of entities already identified.

**Public and private content**

- Watson for Drug Discovery pulls from 23 million Medline standard content source abstracts, over 3 million patents, and 700K plus full text journal articles.
- Watson for Drug Discovery can potentially integrate organizations' private content, such as electronic lab notes, private ontologies, and so on.

**Reviews content in an unbiased manner**

- Watson for Drug Discovery shows all relevant articles, allowing scientists to uncover commonalities they previously may not have considered.

**Dynamic visualizations**
• Unlike similar products that only have static views of content, Watson for Drug Discovery allows researchers to interact with the views by filtering content differently and layering on and adding different entities.
• Watson for Drug Discovery can filter visualizations dynamically based on fields, such as author, date, document text, gene, chemical, and drug, to name a few.
• Researcher is able to see hidden connections and patterns.

Watson for Drug Discovery includes different visualizations to accelerate scientific discovery:

• Entity Explorer: The Entity Explorer application can be used to search scientific literature to find documents that include user-specified entities (including synonyms), and display the documents with key entity types highlighted (for example, genes, drugs, diseases, and so on). The application also provides auxiliary displays, such as publication trends, journal names, Medical Subject Headings (MeSH) terms, and other metadata.
• Co-Occurrence Table: The Co-Occurrence Table can be used to explore and discover affinities between different entities. Results are visualized as a table that shows the level of affinity between the entities in the query and other user-selected entities (for example, genes, MeSH terms, and so on) by virtue of their statistical co-occurrence in the source documents. The table helps reveal potential relationships between terms of different types, such as genes and diseases.
• Biological Entity Network: Biological Entity Network visualization displays connections among genes, drugs, and diseases. These relationships are discovered by Watson for Drug Discovery using machine-learning annotators and they are not drawn from public structured databases. The user can click on individual links in the network to drill down into the supporting literature and understand how the relationship was discovered. Among other things, this application can help accelerate the identification of potential alternative applications for existing drugs and it can help to understand what biological pathways the entities of interest are involved in.
• Reasoning Analysis: The Reasoning Analysis application is used to discover new entities related to a concept or entities of interest based on two query sets (that is, a training set and a candidate set, each specified by the user). The application helps users focus their hypotheses and discover new targets by mapping similarities between concepts or entities using semantic context. For example, if the training set consisted of proteins relevant to Type 2 Diabetes, the application would identify semantically similar proteins in the candidate set; such semantic similarities may suggest proteins that may also be relevant to Type 2 Diabetes. In this manner, this application helps the user to expand a set of research targets. This application reasons that queries are similar if they are surrounded by similar words and phrases. It computes a distance matrix that contains a similarity index for each pair of queries, and a predictive similarity score or heat index that measures each candidate's queries similarity to the training set. The higher the number, the more similar a query is to the entire training set and might be a research target to investigate further. Interactive visualizations allow the user to explore the similarities and the rationale behind them.
• Chemical Search: The Chemical Search application can be used to find chemical compounds that are the same or structurally similar to a compound that the user specifies by name, chemical composition, or molecular structure.
• Post-translational Modification (PTM) Summarisation: PTM Relationship Summarisation visualization can be used to learn about the post translational modification events for a specific protein. PTM is a step in protein biosynthesis in which important changes, such as changes to the chemical nature of an amino acid or changes to the structure and behavior of a protein, occur. Users can click on the interactive graph to get a list of scientific articles that describe the events that occur at that amino acid location and the agents involved in them. The PTM events are discovered by Watson for Drug Discovery from scientific articles using machine-learning annotators.

The production Watson for Drug Discovery environment is managed and hosted in the Watson Cloud Technology and Support cloud environment. However, the process
initially starts in a development environment with a fixed set of public content on which the annotators run. The results are stored in an Apache Solr or IBM® DB2® instance that Watson for Drug Discovery manages and tunes (as well as runs most of the performance testing) prior to pushing to Watson Cloud Technology and Support.

For a private instance of Watson for Drug Discovery, data storage and security are typically managed in the following ways:

- Files are stored on an encrypted file system.
- Private data files will be processed by Watson for Drug Discovery on the Watson Cloud Technology and Support servers.
- Private data files will remain on the Watson Cloud Technology and Support servers and not be moved or copied from the Watson Cloud Technology and Support servers without prior consent from the organization.

Private instance of Watson for Drug Discovery consists of a private VLAN for access with dedicated hardware, management tools, databases, cognitive services, and application instance and tooling. Encryption is enabled end to end, including data at rest.

**Accessibility by people with disabilities**

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be found on the IBM® Accessibility website.

<table>
<thead>
<tr>
<th>Program number</th>
<th>VRM</th>
<th>Program name</th>
</tr>
</thead>
<tbody>
<tr>
<td>5737-B19</td>
<td>SaaS</td>
<td>IBM Watson for Drug Discovery</td>
</tr>
</tbody>
</table>

**Offering Information**

Product information is available on the IBM Offering Information website.

More information is also available on the Passport Advantage® and Passport Advantage Express® website.

**Publications**

Product documentation is available in IBM Knowledge Center.

Product documentation is available only in English.

IBM Knowledge Center is the repository for IBM product documentation. Customize IBM Knowledge Center to design the experience that you want with the technology, products, and versions that you use.

The documentation contains information for business analysts wishing to understand the product functionality, for developers wishing to understand all aspects of developing with the product, and for administrators involved in administration and configuration of the product.

**Technical information**

**Specified operating environment**
**Hardware requirements**

Internet connection is required.

**Software requirements**

Browser is required.

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

**Limitations**

For additional information, refer to the license information document that is available on the IBM Software License Agreement website.

**Planning information**

**Packaging**

These offerings are delivered electronically. There is no physical media. Note that some offerings may include enabling software or utility client applications. Depending on the offering, this software can be downloaded directly from the SaaS offering interface or can be requested through your IBM representative.

**Security, auditability, and control**

Logical security is comprised of several technical controls. The following technical controls are in place:

- Activity logging that includes suspicious activity monitoring of protected logs.
- End-to-end encryption of protected or regulated data.
- Isolation of protected or regulated data. Procedures for an emergency shutdown to prevent data leakage.
- Technical specifications that detail allowable configurations for all devices.
- Timely application of security patches.
- Network configuration that includes zoned security layering enforced by mandatory firewall and router rule sets.
- Security measures for user workstations.
- Antivirus and anti-malware protection with automated workstation compliance tools.
- Intrusion detection systems.
- Change management process and information systems maintenance.
- Audit logs recording privileged user access activities, authorized and unauthorized access attempts, system exceptions, and information security events shall be retained, complying with applicable policies and regulations.
- Audit logs that contain sufficient information to, at a minimum, establish what type of event occurred, when (date and time) the event occurred, where the event occurred, the source of the event, the outcome (success or failure) of the event, and the identity of any user and subject associated with the event.
- When audit logs contain sensitive data and personally identifiable information, appropriate privacy protection measures must be taken.

Watson back-end systems use native identity, policy, and audit enforcement controls in conjunction with IBM Tivoli® Identity Manager workflow and secondary controls, providing an identity and access control system with robust security attributes used to manage access for Watson system administrators. Access to systems that host Watson software as a service (SaaS) offerings is approved based on role requirements. The appropriateness of a user's access is determined using the
principles of least privilege and separation of duties as guidelines. Tivoli Identity Manager is used to retain audit trails of information related to the access control workflow, such as approvals. A periodic revalidation of user access, based on continuous business need and employment verification, is also performed.

IBM employs the latest cryptographic technologies and employs end-to-end encryption. Technology examples include Transport Layer Security (TLS), Internet Protocol Security (IPsec), public key infrastructure (PKI), third-party certification authorities, encrypted file systems, encrypted operating systems, encrypted storage systems, IBM Security Key Lifecycle Manager, encrypted application, among others.

IBM uses the latest tools for encryption key management.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

This product is only available through Passport Advantage. It is not available as shrinkwrap.

Product group: IBM Watson for Drug Discovery

Product Identifier Description (PID): 5737-B19

Product category: Social Program Management

Passport Advantage

<table>
<thead>
<tr>
<th>Part description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Watson for Drug Discovery per Authorized User Subscription per Annum with Support</td>
<td>D1PZALL</td>
</tr>
<tr>
<td>IBM Watson for Drug Discovery Dedicated per Authorized User Subscription per Annum with Support</td>
<td>D1PZBLL</td>
</tr>
</tbody>
</table>

Charge metric

<table>
<thead>
<tr>
<th>Program name</th>
<th>PID number</th>
<th>Charge metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Watson for Drug Discovery</td>
<td>5737-B19</td>
<td>Authorized User</td>
</tr>
</tbody>
</table>

Metric definition

**Authorized User**: Authorized User is a unit of measure by which the IBM SaaS can be obtained. Client must obtain separate, dedicated entitlements for each unique Authorized User given access to the the IBM SaaS in any manner directly or indirectly (for example, through a multiplexing program, device or application server) through any means. Sufficient entitlements must be obtained to cover the number of Authorized Users given access to the IBM SaaS during the measurement period specified in Client’s Proof of Entitlement (PoE) or Transaction Document.

Terms and conditions

The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Passport Advantage Agreement, the International Passport Advantage Express Agreement, the Cloud Services Agreement and associated Service Descriptions, or the IBM SaaS Terms of Use.
This product is only available through Passport Advantage. It is not available as shrinkwrap.

**Subscription**

The IBM International Passport Advantage Agreement and the IBM SaaS Terms of Use or the IBM Cloud Services Agreement (CSA) and the Service Description govern your use of this offering.

**Technical support**

Technical support is provided for IBM SaaS and enabling software, as applicable, during the subscription period. Any enhancements, updates and other materials provided by IBM as part of any such technical support are considered to be part of IBM SaaS or enabling software, as applicable, and therefore governed by the SaaS Terms of Use or the CSA and associated Service Description. Technical support is included with IBM SaaS and is not available as a separate offering.

Refer to additional technical support information in the IBM Software as a Service Terms of Use document for the program.

**Terms of Use**

The program's *Terms of Use and CSA Service Description* document is available on the [Software as a Service terms](https://www.ibm.com) website.

**Limited warranty**

If warranted, refer to the warranty as stated in the Terms of Use document or the Cloud Services Agreement for this offering.

**Money-back guarantee**

No

**Volume orders (IVO)**

No

**Passport Advantage applies**

Yes, information is available on the [Passport Advantage and Passport Advantage Express](https://www.ibm.com) website.

**Software Subscription and Support applies**

No

**System i Software Maintenance applies**

No

**Variable charges apply**

No

**Educational allowance available**
Statement of good security practices

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a lawful, comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective.

**Important:** IBM does not warrant that any systems, products, or services are immune from, or will make your enterprise immune from, the malicious or illegal conduct of any party.

Prices

For all local charges, contact your IBM representative.

**Passport Advantage**

For Passport Advantage information and charges, contact your IBM representative. Additional information is also available on the Passport Advantage and Passport Advantage Express website.

**IBM Global Financing**

IBM Global Financing offers competitive financing to credit-qualified customers to assist them in acquiring IT solutions. Offerings include financing for IT acquisition, including hardware, software, and services, from both IBM and other manufacturers or vendors. Offerings (for all customer segments: small, medium, and large enterprise), rates, terms, and availability can vary by country. Contact your local IBM Global Financing organization or go to the IBM Global Financing website for more information.

IBM Global Financing offerings are provided through IBM Credit LLC in the United States, and other IBM subsidiaries and divisions worldwide to qualified commercial and government customers. Rates are based on a customer’s credit rating, financing terms, offering type, equipment type, and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice.

Financing from IBM Global Financing helps you preserve cash and credit lines, enables more technology acquisition within current budget limits, permits accelerated implementation of economically attractive new technologies, offers payment and term flexibility, and can help match project costs to projected benefits. Financing is available worldwide for credit-qualified customers.

**AP distribution**

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Announced</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP IOT</td>
<td></td>
</tr>
<tr>
<td>ASEAN *</td>
<td>Yes</td>
</tr>
<tr>
<td>India/South Asia **</td>
<td>Yes</td>
</tr>
<tr>
<td>Australia</td>
<td>Yes</td>
</tr>
<tr>
<td>Country/Region</td>
<td>Announced</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Yes</td>
</tr>
<tr>
<td>Macao SAR of the PRC</td>
<td>Yes</td>
</tr>
<tr>
<td>Mongolia</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Yes</td>
</tr>
<tr>
<td>People's Republic of China</td>
<td>No</td>
</tr>
<tr>
<td>South Korea</td>
<td>Yes</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Yes</td>
</tr>
<tr>
<td>Japan IOT</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Timor-Leste Vietnam

** Bangladesh, Bhutan, India, Maldives, Nepal, and Sri Lanka

**Trademarks**

IBM Watson and Watson are trademarks of IBM Corporation in the United States, other countries, or both.

IBM, Passport Advantage, System i, DB2, Express and Tivoli are registered trademarks of IBM Corporation in the United States, other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

**Terms of use**

IBM products and services which are announced and available in your country can be ordered under the applicable standard agreements, terms, conditions, and prices in effect at the time. IBM reserves the right to modify or withdraw this announcement at any time without notice. This announcement is provided for your information only. Additional terms of use are located at

Terms of use

For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page

IBM Japan