

PATENT ASSIGNMENT

Electronic Version v1.1
 Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	SECURITY AGREEMENT
CONVEYING PARTY DATA	
Name	Execution Date
Deutsche Effecten- und Wechsel-Beteiligungsgesellschaft AG	12/22/2010
RECEIVING PARTY DATA	
Name:	IG Assets, Inc.
Street Address:	1749 West Golf Road #106
City:	Mount Prospect
State/Country:	ILLINOIS
Postal Code:	60056-4025
PROPERTY NUMBERS Total: 5	
Property Type	Number
Application Number:	09793705
Application Number:	09794411
Application Number:	12346550
Patent Number:	7659105
PCT Number:	US0772882
CORRESPONDENCE DATA	
Fax Number:	(515)558-7790
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>	
Phone:	515.558.0200
Email:	tzarley@zarleylaw.com
Correspondent Name:	Zarley Law Firm, P.L.c.
Address Line 1:	400 Locust Street
Address Line 2:	Capital Square, Suite 200
Address Line 4:	Des Moines, IOWA 50309-2350
ATTORNEY DOCKET NUMBER:	MAC PHERSON GROUP, INC.
NAME OF SUBMITTER:	Timothy J. Zarley

OP \$200.00 09793705

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REEL: 025568 FRAME: 0781

Total Attachments: 17

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INTELLECTUAL PROPERTY ASSIGNMENT

THIS ASSIGNMENT OF INTELLECTUAL PROPERTY (*Assignment*) is made as of December 22, 2010 (*Effective Date*) between DEUTSCHE EFFECTEN-UND WECHSEL-BETEILIGUNGSGESELLSCHAFT AG, a corporation organized under the laws of Germany, registered with the local court (Amtsgericht) of Jena under registration number HRB 208401, and having a registered address of Leutragraben 1, D-07743 Jena, Germany, (*DEWB and Secured Party*) and IG ASSETS, INC., a corporation organized under the laws of Illinois, having an address of 1749 West Golf Road #106, Mount Prospect, IL 60056 – 4025, (*IG Assets*).

WHEREAS, DEUTSCHE EFFECTEN-UND WECHSEL-BETEILIGUNGSGESELLSCHAFT AG is the rightful owner as the Secured Party pursuant to a Note Purchase Agreement, dated 5 September 2005, (in addition to any subsequent agreements thereof, as from time to time amended, revised, modified, supplemented, amended and restated, or replaced, renewed, refunded or refinanced) in addition to a Security Agreement dated as of 5 September 2005 by and among the Secured Party and Debtor - INTEGRATED GENOMICS, INC., a corporation organized under the laws of the state of Illinois, having an address of 2355 South Arlington Heights Road, Suite 270, Arlington Heights, IL 60005, of the following Intellectual Property (*Intellectual Property*):

ERGO software; All Associated Intellectual Property (*Associated Intellectual Property*) related to the Ergo Software, wherein Associated Intellectual Property means all past, present, and future:

- (a) trade secrets and other proprietary information;
- (b) trademarks, service marks, business names, designs, logos, indicia and all other related source and/or business identifiers and the goodwill of the business relating thereto and all registrations or applications for registrations for the foregoing which have heretofore been or which may

hereafter be issued thereon in the United States and/or throughout the world;

- (c) copyrights (un-registered and registered) including but not limited to copyrights for computer programs and source code, copyright registrations and/or applications for registrations which have heretofore been or may hereafter be issued throughout the world and all tangible property embodying the copyrights;
- (d) unpatented inventions (whether or not patentable);
- (e) any and all patent applications and patents;
- (f) any and all industrial designs, industrial design applications and registered industrial designs;
- (g) any and all trade secrets and other proprietary information;
- (h) any and all license agreements related to any of the foregoing and income therefrom;
- (i) any and all books, records, writings, computer tapes or disks, flow diagrams, specification sheets, source codes, object codes and other physical manifestations, embodiments or incorporations of any of the foregoing;
- (j) the right to sue for all past, present, and future infringements of any of the foregoing; and
- (k) and any and all common law and other rights in the United States and throughout the world in and to all of the foregoing manifestations and forms of the Secured Intellectual Property;

Any and all licenses, options, warranties, service contracts, program services, test rights, maintenance rights, support rights, improvement rights, renewal rights and indemnifications, and any substitutions, replacements, additions or model conversions of any of the foregoing; All accessions, additions, attachments and improvements to, and substitutions and replacements of, any and all of the foregoing; All proceeds and products of the foregoing and all insurance of the foregoing and proceeds thereof; together with all books, records, writings, databases, information and other property relating to, used or

useful in connection with, or evidencing, embodying, incorporating or referring to any of the foregoing, and all proceeds, products, offspring, rents, issues, profits and returns of and from any of the foregoing including without limitation, all dividends, distributions and sums distributable or payable from, upon or in respect thereof; all of which evidenced and including, in part, the Secured Intellectual Property included in the attached Schedules attached hereto.

WHEREAS, the IG Assets is desirous of acquiring the entire right, title and interest in said Intellectual Property and agrees that all pertinent information provided, disclosed or obtained in connection with this Assignment or the performance of any of DEWB's and IG Assets' activities under this Assignment shall held confidential, particularly with respect to the trade secret information pertaining to the Intellectual Property contained herein.

NOW, THEREFORE, for good and valuable consideration, including but not limited to the exchange of shares of stock and equity in IG Assets, the receipt and sufficiency whereof are hereby acknowledged, DEWB does hereby transfer, convey, and assign and delivers to IG Assets and IG Assets accepts all right, title, and interest in all Intellectual Property in addition to the full extent of DEWB's rights in connection therewith as defined above and including but not limited to the following:

- (a) Any and all of present and future United States registered copyrights and copyright registrations in the Intellectual Property and any and all of present and future copyrights in the Intellectual Property and associated rights therein which are not registered in the United States Copyright Office, whether now owned or hereafter acquired, including, without limitation, the copyrights listed in Schedule I attached hereto (and including all of the exclusive rights afforded a copyright registrant in the United States under 17 U.S.C. §106 and any exclusive rights which may in the future arise by act of Congress or otherwise) and all

present and future applications for copyright registrations in the Intellectual Property including, without limitation, the copyrights listed in Schedule I attached hereto (including applications for copyright registrations of derivative works and compilations), and any and all royalties, payments, and other amounts payable to DEWB in connection with the registered and unregistered copyrights in the Intellectual Property, together with all renewals and extensions of the registered and unregistered copyrights in the Intellectual Property, the right to recover for all past, present, and future infringements of the registered and unregistered copyrights in the Intellectual Property, and all computer programs, computer databases, computer program flow diagrams, source codes, object codes and all tangible property embodying or incorporating the registered and unregistered copyrights in the Intellectual Property including, without limitation, the copyrights listed in Schedule I, and all other rights of every kind whatsoever accruing thereunder or pertaining thereto;

- (b) All right, title and interest in and to any and all present and future license agreements with respect to the registered and unregistered copyrights in the Intellectual Property;
- (c) All present and future accounts, accounts receivable and other rights to payment arising from, in connection with or relating to the registered and unregistered copyrights in the Intellectual Property;
- (d) Any and all trade secrets in the Intellectual Property, including but not limited to any and all intellectual property rights in computer software and computer software products now or hereafter existing, created, acquired or held including, but without limitation, all computer programs, computer databases, computer program flow diagrams, source codes, object codes and all tangible property embodying or incorporating the Intellectual Property and the copyrights and materials listed in Schedules I & II in addition to all applicable knowledge, expertise,

- involvement, familiarity, and any and all associated economic and competitive advantages and value associated with the foregoing;
- (e) All United States and foreign inventions, patents, patent applications (both pending, issued, expired, and/or abandoned), and like protections in the Intellectual Property including, without limitation, improvements, divisions, continuations, renewals, reissues, extensions and continuations-in-part of the same, in addition to any and all design and manufacturing rights for inventions, both patented and unpatented either in the United States and abroad, which may be available to DEWB now or hereafter existing, created, acquired or held including without limitation inventions embodied by the patents and patent applications set forth on Schedule III attached hereto;
 - (f) Any trademark and servicemark rights, including but not limited to word marks, symbols, and the like, in the Intellectual Property, both registered and un-registered (whether pending, issued, expired, and/or abandoned), including, without limitation, federal and common law trademark and service mark rights in the Intellectual Property, in addition to applications to register and registrations of the same and like protections and the right to apply for registration of the same with the United States Patent and Trademark Office and trademark offices throughout the world, and the entire goodwill of the business related to the foregoing Intellectual Property connected with and symbolized by such trademarks, servicemarks, words, and/or symbols, including without limitation those set forth on Schedule IV attached hereto;
 - (g) Any and all domain names and registrations therefor in and used in connection with the Intellectual Property (and the associated website content therein) including but not limited to those set forth in Schedule V hereto;
 - (h) Any and all goodwill and other intangible assets in and used in connection with the Intellectual Property, including, without limitation,

if and to the extent in existence and not listed above, any and all trade secrets, inventions, designs, copyrights, non-registered trademarks and other intellectual property, know-how, manufacturing methods and processes;

- (i) Any and all claims for damages by way of past, present and future infringements of any of the rights included above, with the right, but not the obligation, to sue for and collect such damages for said use or infringement of the intellectual property rights identified above except for the pending lawsuit with Gerngross;
- (j) All licenses or other rights to use any of the above Intellectual Property and all license fees and royalties arising from such use to the extent permitted by such license or rights;
- (k) All amendments, extensions, renewals and extensions of any of the above Intellectual Property.

IN WITNESS WHEREOF, DEWB and IG Assets caused this Assignment to be duly executed as of the Effective Date written above.

Deutsche Effecten- und Wechsel-Beteiligungsgesellschaft AG

Leutragraben 1

D-07743 Jena

Germany

Tel: +49(0)3641.573.3600

Fax: +49(0)3641.573.3610

Registered Office: Jena

Commercial Registry: Amtsgericht Jena, HRB 208401

Tax No.: 161/100/02800



Bertram Köhler

Member of Management Board



Mirko Wäckerle

Member of Management Board

IG Assets, Inc.

1749 West Golf Road # 106

Mount Prospect, IL 60056 – 4025

John W. Elling

Incorporator and Registered Agent

Vorstehende, heute vor mir eigenhändig vollzogene
Unterschriften von

1. Herrn Bertram Köhler,
geboren am 2. Oktober 1971,
ausgewiesen durch seinen Personalausweis der
Bundesrepublik Deutschland,
2. Herrn Mirko Wäckerle,
geboren am 4. Juli 1968,
ausgewiesen durch seinen Personalausweis der
Bundesrepublik Deutschland,

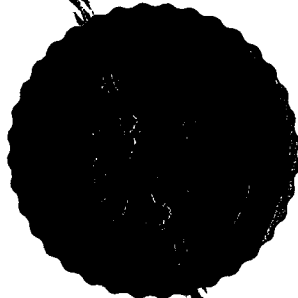
beide geschäftsansässig Leutragraben 1,
D-07743 Jena, Bundesrepublik Deutschland,

werden hiermit beglaubigt.

Die Herren Köhler und Wäckerle handeln nicht im
eigenen Namen, sondern als gemeinschaftlich
vertretungsberechtigte Vorstandsmitglieder für die
Deutsche Effecten- und Wechsel-
Beteiligungsgesellschaft AG mit Sitz in Jena.

Ihre Vertretungsberechtigung wurde nachgewiesen
durch Abdruck des elektronischen
Handelsregisterausdruckes: HRB 208401, vom
heutigen Tage, des Amtsgerichtes Jena, in den ich
Einsicht nahm, was ich hiermit bescheinige.

Der Notar fragte nach einer Vorbefassung im Sinne
von § 3 Abs. 1 Nr. 7 BeurkG. Sie wurde von allen
Beteiligten verneint.



Der für diese Beglaubigung maßgebliche Text ist
derjenige, der in der deutschen Sprache abgefasst ist.

Jena, den 22. Dezember 2010



Muth

Above, in front of me personally accomplished
signatures on this day of

1. Mr. Bertram Köhler,
born on 2 October 1971,
proving his identity by his identity card of the
Federal Republic of Germany,
2. Mr. Mirko Wäckerle,
born on 4 July 1968,
proving his identity by his identity card of the
Federal Republic of Germany,

both residing Leutragraben 1,
D-07743 Jena, Germany,

are hereby notarized.

Mr. Köhler and Mr. Wäckerle are not acting on behalf
on themselves but with joint power of representation
as members of the board of directors of Deutsche
Effecten- und Wechsel-Beteiligungsgesellschaft AG
with stated domicile in Jena.

Their proxy is confirmed by electronic excerpt from
the commercial register: HRB 208401 as of today of
the Commercial Registry (Amtsgericht) Jena where I
took inspection and hereby confirm.

The notary public has explained the prohibition of
participation pursuant to the German Act on
Notarization (Deutsches Beurkundungsgesetz,
§ 3 para. 1 No.7). The question whether the notary
public or a partner in his firm or any other person
professionally associated with the notary or executing
his business within shared office premises together
with the notary public has been involved in the
respective matter was negated by the parties and by
the notary.

The wording decisive for this notarization of
signatures shall be the wording in the German
language.

Jena, December 22nd, 2010

PATENT

REEL: 025568 FRAME: 0790

IN WITNESS WHEREOF, DEWB and IG Assets caused this Assignment to be duly executed as of the Effective Date written above.

Deutsche Effecten- und Wechsel-Beteiligungsgesellschaft AG

Leutragraben 1

D-07743 Jena

Germany

Tel: +49(0)3641.573.3600

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Registered Office: Jena

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Tax No.: 161/100/02800

Bertram Köhler

Member of Management Board


Mirko Wackerle

Member of Management Board

IG Assets, Inc.

1749 West Golf Road # 106

Mount Prospect, IL 60056 - 4025



John W. Elling

Incorporator and Registered Agent

Subscribed and Sworn to Before Me

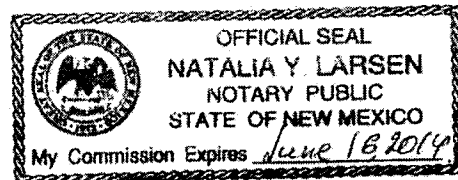
This 22 Day of December 2010

By John W. Elling

Natalia Y. Larsen
Notary Public for the State of New Mexico.

County of Santa Fe

My Commission Expires June 18 2014



SCHEDULE I: COPYRIGHTS

The ERGO Software, including but not limited to:
the software as embodied and implemented as provided in Schedule II,
the current version of the ERGO Software
all prior versions of the ERGO Software
any and all past, current, and future derivations, modifications, and revisions of the ERGO Software

The symbols associated with the trademarks and service marks as provided in Schedule IV

The content associated with the web sites and domain names as provided in Schedule V

SCHEDULE II: TRADE SECRETS

1. **Formalism of adding a genome in to the ERGO genome analysis environment:** there are numerous pre-processing operations that take place prior to a particular genome entering into the ERGO system. While it is published that we do some of this (Overbeek et al, 2003) other databases (*e.g.* KEGG, TIGR, GenBank, EMBL) do not perform such a procedure, since it is very time consuming (FTE- and CPU-time). There are several steps that include:
 - Identification of open-reading reading frames (IG uses 3 different ORF callers-Critica, Glimmer2 and PPEG caller (IG), the results of which are merged and potential ORF overlap-conflicts resolved. Oakridge National Labs does the ORF calling for JGI genomes not the IMG group directly, thus the exact formalism is unlikely to be similar to that at IG. Genomic features identified by IG include ORFs encoding proteins, RNAs (*e.g.* tRNAs, rRNAs) and IS elements.
 - Protein similarity calculations (all-against-all)
 - Bi-directional best-hits (BBHs) calculation, developed by Dr Ross Overbeek (Argonne)
 - Calculation of protein fusion events, developed by Dr Mark D'Souza (Argonne)

Once certain key aspects of a genome are determined in such a way (*e.g.* coordinates of all features on the genomic DNA, protein similarities, *etc.*) the genome is added (or updated) into the ERGO database. The IG formalism is elaborate and other genome databases (*e.g.* KEGG, TIGR, GenBank, EMBL) do not implement such a procedure.

2. **All-against-all protein similarity calculations:** once open-reading frames (ORFs) are identified and translated into protein sequences, protein similarities are calculated, all proteins against all other proteins in the Integrated Genomics ERGO non-redundant (nr) database. No other public genome database (*e.g.* KEGG, TIGR, GenBank, EMBL) does this, although it is very useful data that is generated.
3. **Automated annotation pipeline:** Once a new genome is updated into ERGO (see point 1 above) automated gene assignments are made. In this process a new ORF with an unassigned function requires, the top 5 top-protein hits to it to have a protein similarity threshold above P-score (*e-value*): $1e-20$ (by default). If the top-hits satisfy these criteria and the top-hits also display the identical and homogeneous functional ORF annotation syntax to each other, then the new ORF will be assigned the functional annotation of the top-hit. There are additional options in the ERGO automated annotation tools that can also be invoked to resolve the occurrence of unannotated ORFs in the top 5 protein similarity hits. Thus, the ERGO auto annotations relies on having a clean set of internal annotations present in the database.
4. **Automated pathway assertions:** In ERGO, after the automated ORF functional annotations are performed, the individual ORF functions are connected to the IG-ERGO pathway collection. The pathways are asserted (or predicted to exist in the genome of an organism) if all enzymatic or functional steps in the specific pathway (a collection of a series of functions encoded by ORFs) exist. Specifically, if ORFs are functionally annotated with the exact syntax as exists in the pathway collection table in ERGO (pw_func.table, a list of all ERGO pathways and their respective steps), the pathway will be asserted. If essential steps in a pathway are

absent (with one exception) the pathway is not asserted in this automated round. There is an exception here which is important; there is a list of pathways in ERGO that comprise important 'house-keeping' functions, in those pathways, since organisms must have them, those pathways must and will be asserted to that organism/genome even if some steps are missing in those pathways. The scheme was developed at IG to minimize the manual intervention at the pathway assertion stage.

5. **Creation of annotation UserModels:** IG developed the concept of the specific term 'UserModels', a term applied to the functional annotation of ORFs (a.k.a. genes, CDSs) by other public databases/users. The presence of these alternate annotation sets for a particular genome can help in a) the appraisal of in-house IG-ERGO genome annotation sets and, b) improve in-house annotations by highlighting instances where an external annotation for a particular ORF exists and an in-house function for the same ORF does not. These UserModels are regularly calculated in ERGO and can include the public tool-sets COGs (Clusters of Orthologous Groups, developed at NCBI) and Pfam (University of Washington, St. Louis).
6. **Manual annotation procedures:** In addition to points 3 and 5 above regarding the annotation process, the curation team at IG applies certain strategies in analyzing the gene functions of a new or existing genome in the ERGO database:
 - a) After the automated annotations have been performed a proportion of unannotated ORFs exist that need to be curated manually. One approach is to compare and reconcile unannotated ORFs in the ERGO database *versus* other public database tools (COGs/Pfam) as described in point 5 above. Another approach is to create a list of ORFs from the genome being analyzed that have protein similarity scores to other protein(s) in the nr above a P-score(e-value) $1e-5$. This set of proteins, that have no functional assignments but have best-hits to proteins that do, is referred within IG as proteins with 'Strong-hits No Function'. These proteins can then be analyzed using IG internal and external (public) tools to discern a potential gene function.
 - b) Identification of missing enzymatic functions from existing pathways. Part of the ERGO annotation process, after first curating ORFs with 'Strong-hits no function' and comparing the internal annotations with COGs/Pfam annotations (e.g. using 'Reconcile Models'), is to identify functions encoded by ORFs that are missing from existing pathways. Some of these so-called missing functions can be predicted by using chromosomal clustering tools. An ERGO tool that does this is called 'Pinned Regions', a feature that IG pioneered prior to being reported publicly at NCBI (Conserved gene strings; Wolf et al, 2001) and EMBL (STRING; Snel *et al*, 2000).

SCHEDULE III: PATENTS AND PATENT APPLICATIONS

U.S. Pat. Application No. 09/793,705

Title: Nicotinamide ribonucleoside kinase

Filed: 2/27/2001

U.S. Pat. Application No. 09/794,411

Title: System, method and computer program product for simultaneous analysis of multiple genomes

Filed: 02/28/2001

U.S. Pat. Application No. 12/346,550

Title: Compositions and Methods for Enhancing Glycerol Utilization

Filed: 12/30/2008

U.S. Pat. No. 7,659,105

Title: METHODS AND COMPOSITIONS FOR BUTANOL PRODUCTION

Filed: 12/30/2008

Issued: 02/09/2010

WIPO PCT/US07/72882, EP 07799334.3

Title: Compositions and Methods for Enhancing Glycerol Utilization

Filed: 07/05/2007

SCHEDULE IV: TRADEMARKS, SERVICE MARKS AND DESIGN MARKS/LOGOS

Word Marks:

INTEGRATED GENOMICS™

ERGO™

PATHWAYS™

GenomeWalk™

ERGO Light

U.S. Trademark Registrations:

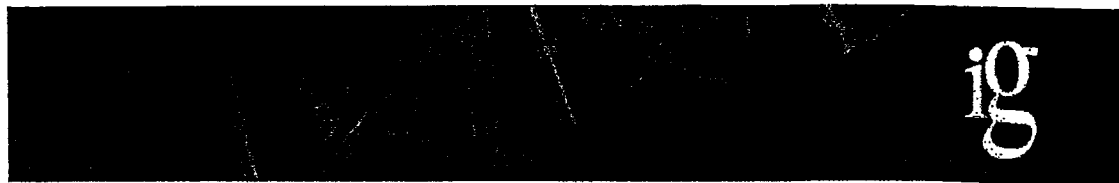
Mark: BIOCONTEXT

Serial No: 76256741

Mark: MICROBACE

Serial No: 75547124

Design Marks/Logos:



ERGO™

**Integrated
Genomics**

ERGO light

SCHEDULE V: DOMAIN NAMES AND ASSOCIATED WEBSITE CONTENT

Domain Names:

<http://www.integratedgenomics.com/>

<http://ergo.integratedgenomics.com/ERGO/>

<http://www.ergo-light.com/ERGO/>

Website Content:

