

# Ibon Martínez-Arranz

Mathematician and Data Scientist



## PROFESSIONAL EXPERIENCE

### Currently

Ibon Martínez-Arranz got his BSc. in Mathematics from the University of the Basque Country (EHU/UPV) and performed a MSc. in Current Applied Statistics Techniques and a MSc. in Mathematical Modeling Research, Statistical Analysis and Computing Sciences. In 2004, he joined the Basque Country Health Service (The Department of Health of the Basque Country Government and Osakidetza) as a data analyst and his work was mainly focused on the epidemiological report of renal patients. When he joined OWL Metabolomics in 2010, Ibon first worked as a researcher in the Metabolomics Department and in 2017, he became the head of the Data Science Department, being responsible for prediction and statistical computation management since then. This highly experienced team supports metabolomics services, laboratory processes, data handling, R&D projects and technology transfer processes.

Currently, I am doing a doctoral thesis entitled "Genetic Algorithms Applied to Translational Strategy in NASH. Learning from Mouse Models" under the supervision of José María Mato (General Director of CIC bioGUNE) and Dae-Jin (Data Science line leader of Basque Center for Applied Mathematics, BCAM) in which I apply genetic algorithms for the selection of NAFLD subtypes. This procedure could be applied to any disease that is based on metabolic changes. This work also has implications in the field of precision medicine.

### Employment

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|-----------|--|
| 2017      | <b>OWL (One Way Liver, S.L.) Data Science Manager.</b><br>Data Processing and Analysis, Statistical Studies and Operational Research. Statistical data processing and analysis. Collaboration in the preparation of technical reports. Elaboration of the statistical methodology used and justification.                          |
| 2010-2017 | <b>OWL (One Way Liver, S.L.) Data Processing and Analysis.</b><br>Data Processing and Analysis, Statistical Studies and Operational Research. Statistical data processing and analysis. Collaboration in the preparation of technical reports. Elaboration of the statistical methodology used and justification.                  |
| 2004-2010 | <b>COHS Consultores en Ciencias Humanas, S.L. Data Processing and Analysis.</b><br>Data Processing and Analysis, Statistical Studies and Operational Research. Statistical data processing and analysis. Collaboration in the preparation of technical reports. Elaboration of the statistical methodology used and justification. |

## EDUCATION

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|-----------|--|
| Currently | PhD student  |
| 2015-2016 | MSc degree in Mathematical Modelling, Statistical Analysis and Computation. <i>University of the Basque Country</i>  |
| 2012-2013 | Expert degree in Multivariate Statistical Techniques, <i>Universidad Nacional de Educación a Distancia, UNED.</i>    |
| 2011-2012 | MSc degree in Current Applied Statistics Techniques, <i>Universidad Nacional de Educación a Distancia, UNED.</i>     |
| 2007-2008 | Expert degree in Advanced Methods of Applied Statistics, <i>Universidad Nacional de Educación a Distancia, UNED.</i> |
| 2006-2007 | Expert degree in Statistics Applied to Health Sciences, <i>Universidad Nacional de Educación a Distancia, UNED.</i>  |
| 2003      | BSc degree in Mathematics. <i>Faculty of Science and Technology, University of the Basque Country.</i>               |

## COMPLEMENTARY EDUCATION

2022	<b>Curso de MongoDB</b> , Datademia, 30h.
2021	<b>Curso completo de SQL</b> , Datademia, 30h.
2021	<b>Python para Ciencia de Datos</b> , Datademia.
2019	<b>Decision, Data and Machine Learning</b> , Santiago Mazuelas. <b>BCAM</b> - UPV/EHU, 10h.
2019	<b>Measurement Error and Misclassification</b> , Helmut Küchenhoff. <b>BCAM</b> - UPV/EHU, 10h.
2018	<b>Introducción a Python para el Análisis de Datos</b> , EUSKADinnova, 8h.
2018	<b>PYTHON y PANDAS</b> , CEINTEC, 20h.
2017	<b>Introducción to Machine Learning</b> , Carlos Cernuda, Carmen Ana Domínguez, Ekhine Irurozki & Aritz Pérez. <b>BCAM</b> - UPV/EHU, 10h.
2017	<b>Second Bilbao Data Science Workshop</b> , <b>BCAM</b> , Bilbao, 16th-17th November, 2017.
2016	<b>Introduction to Statistical Modelling in R</b> , Dae-jin LEE. <b>BCAM</b> - UPV/EHU, 10h.
2006	<b>Introducción a la Programación SAS</b> , Prof. Dra. Rosa Elvira Lillo. Universidad Carlos III de Madrid, 25h.
2005	<b>Diseño en Implantación de Bases de Datos</b> , MIKELDI, Ciclos Superiores y Medios, 60h.
2004	<b>Estadística para todos (Curso de Verano, UPV)</b> , Prof. D. Xavier Tort-Martorell. Universidad Politécnica de Cataluña, 10h.

## COMPUTER & IT SKILLS

Structured Programming	<b>Python</b> , FORTRAN, C/C++, Visual Basic
Scientific Programming & Statistics	<b>R</b> , <b>GNUplot</b> , <b>Julia</b> , SPSS, SAS, Matlab, Mathematica
R Utilities	<b>RStudio</b> , <b>RKward</b> , Tinn-R, Sweave, <b>knitr</b> , <b>Rmarkdown</b> , <b>Tidyverse</b>
Python Utilities	<b>ANACONDA</b> , <b>Jupyter</b> , <b>JupyterLab</b> , <b>Spyder</b>
Data Bases & Big Data Analysis	<b>MySQL</b> , <b>SQLite</b> , <b>spark</b> , <b>H2O</b>
Machine Learning Utilities	<b>Sklearn</b> , <b>Scikit-Learn Laboratory</b> , <b>caret</b>
Linear Programming	<b>CPLEX</b> , <b>COIN-OR</b> , <b>GUSEK</b>
Design	<b>LaTeX</b> , <b>Gimp</b> , <b>Inkscape</b>
Office IT	<b>Microsoft Office</b> (Word, PowerPoint, Excel, Access), <b>OpenOffice</b>

**SOFTWARE  
DEVELOPMENT****OwlStatApp**

Metabolomics research has evolved considerably, particularly during the last decade. Over the course of this evolution, the interest in this omic discipline is now more evident than ever. However, the future of metabolomics will depend on its capability to find biomarkers. For that reason, data mining constitutes a challenging task in metabolomics workflow, being a time-consuming issue which usually requires detailed knowledge of bioinformatics, statistics and specialized software. We have developed OWL Stat App, an easy-to-use web application for metabolomics data analysis. It combines powerful univariate and multivariate data analysis with pathway mapping tools and visualization capacities to facilitate interpretation of the results.

| [OwlStatApp](#) |

**AgingAnalysis**

Metabolomics research has evolved considerably, particularly during the last decade. Over the course of this evolution, the interest in this omic discipline is now more evident than ever. However, the future of metabolomics will depend on its capability to find biomarkers. For that reason, data mining constitutes a challenging task in metabolomics workflow. This work has been designed in support of the research article entitled Enhancing metabolomics research through data mining, which proposed a methodological data handling guideline. An aging research in healthy population was used as a guiding thread to illustrate this process. Here we provide a further interpretation of the obtained statistical results. We also focused on the importance of graphical visualization tools as a clue to understand the most common univariate and multivariate data analyses applied in metabolomics.

| [AgingAnalysis](#) |

**PyGenMet**

A Python package for Genetics Algorithms.

| [PyGenMet](#) | [Manual](#) |

## PUBLICATIONS

- 2022** 2022 **Metabolic subtypes of nonalcoholic fatty liver disease patients exhibit distinctive cardiovascular risk profiles**, Ibon Martínez-Arranz, Chiara Bruzzone, Mazen Nouredin, Ruben Gil-Redondo, Itziar Mincholé, Maider Bizkarguenaga, Enara Arretxe, Marta Iruarizaga-Lejarreta, David Fernández-Ramos, Fernando Lopitz-Otsoa, Rebeca Mayo, Nieves Embade, Elizabeth Newberry, Bettina Mittendorf, Laura Izquierdo-Sánchez, Vaclav Smid, Jorge Arnold, Paula Iruzubieta, Ylenia Pérez Castaño, Marcin Krawczyk, Urko M Marigorta, Martine C Morrison, Robert Kleemann, Antonio Martín-Duce, Liat Hayardeny, Libor Vitek, Radan Bruha, Rocío Aller de la Fuente, Javier Crespo, Manuel Romero-Gomez, Jesus M Banales, Marco Arrese, Kenneth Cusi, Elisabetta Bugianesi, Samuel Klein, Shelly C Lu, Quentin M Anstee, Oscar Millet, Nicholas O Davidson, Cristina Alonso, José M Mato *Hepatology*, 2022  
| [doi](#) |
- 2020** 2020 **The lipidome of endometrial fluid differs between implantative and non-implantative IVF cycles**, Roberto Matorras, Ibon Martínez-Arranz, Enara Arretxe, Marta Iruarizaga-Lejarreta, Blanca Corral, Jone Ibañez-Perez, Antonia Exposito, Begoña Prieto, Felix Elortza, Cristina Alonso *Journal of Assisted Reproduction and Genetics*, 2020 Feb 37(2): 385-394  
| [doi](#) | [pubmed](#) |
- 2020** 2020 **A novel serum metabolomic profile for the differential diagnosis of distal cholangiocarcinoma and pancreatic ductal adenocarcinoma**, Rocío IR Macías, Luis Muñoz-Bellvis, Anabel Sánchez-Martin, Enara Arretxe, Ibon Martínez-Arranz, Ainhoa Lapitz, M Laura Gutiérrez Adelaida La Casta, Cristina Alonso, Luis M González, Matías A Ávila, María L Martínez-Chantar, Rui E Castro, Luis Bujanda, Jesus M Bañales, Jose J.G. Marín. *Cancers*, 2020.  
| [doi](#) |
- 2020** 2020 **Agonist of RORA Attenuates Non-Alcoholic Fatty Liver Progression in Mice via Upregulation of microRNA 122**, Chofit Chai, Bryan Cox, Dayana Yaish, Devora Gross, Nofar Rosenberg, Franck Amblard, Zohar Shemuelian, Maytal Gefen, Amit Korach, Oren Tirosh, Tali Lanton, Henrike Link, Joseph Tam, Anna Permikov, Gunes Ozhan, Jonathan Citrin, Haixing Liao, Mirna Tannous, Michal Hahn, Jonathan Axelrod, Enara Arretxe, Cristina Alonso, Ibon Martínez-Arranz, Pablo Ortiz Betés, Rifaat Safadi, Ahmad Salhab, Johnny Amer, Zahira Tber, Seema Mengshetti, Hilla Giladi, Raymond F. Schinazi, Eithan Galun *Gastroenterology*, 2020  
| [doi](#) |
- 2020** 2020 **CA19-9 capability as predictor of pancreatic cancer resectability in a Spanish cohort**, Herreros-Villanueva M., Ruiz-Rebollo L., Montes M., Rodriguez-Lopez M., Francisco M., Cubiella J., Iyo E., Garabitos E., Martínez Moneo E., Martos M., de Madaria E., Martínez-Arranz I., García-Cougil M., Iglesias-Gómez A., Bujanda L. *Molecular Biology Report*, 2020 Mar 47(3): 1583-1588.  
| [doi](#) | [pubmed](#) |
- 2019** 2019 **Metabolomics Discloses a New Non-invasive Method for the Diagnosis and Prognosis of Patients with Alcoholic Hepatitis**, Javier Michelena, Cristina Alonso, Ibon Martínez-Arranz, José Altamirano, Rebeca Mayo, Pau Sancho-Bru, Ramón Bataller, Pere Ginès, Azucena Castro, Juan Caballería, *Annals of Hepatology, Annals of Hepatology*, 2019 Feb-Mar 18 (1): 144-154  
| [doi](#) | [abstract](#) | [pubmed](#) |
- 2019** 2019 **Metabolomics discloses potential biomarkers to predict the acute HVP response to propranolol in patients with cirrhosis**, Enric Reverter, Juan José Lozano, Cristina Alonso, Annalisa Berzigotti, Susana Seijo, Fanny Turon, Anna Baiges, Mari Luz Martínez-Chantar, José M. Mato, Ibon Martínez-Arranz, Vincenzo La Mura, Virginia Hernández-Gea, Jaume Bosch, Juan Carlos García-Pagán, *Liver International*, Jan. 13, 2019  
| [doi](#) | [abstract](#) | [pubmed](#) |
- 2019** 2019 **Plasma miRNAs signature validation for early detection of colorectal cancer**, Marta Herreros-Villanueva, Saray Duran-Sanchon, Ana Carmen Martín, Rosa Pérez-Palacios, Elena Vila-Navarro, María Marcuello, Mireia Diaz-Centeno, Joaquín Cubiella, María Soledad Diez, Luis Bujanda, Angel Lanás, Rodrigo Jover, Vicent Hernández, Enrique Quintero, Juan José Lozano, Marta García-Cougil, Ibon Martínez-Arranz, Antoni Castells, Meritxell Gironella and Rocío Arroyo *Clinical and Translational Gastroenterology*, Jan. 10, 2019  
| [doi](#) | [PMC](#) | [pdf](#) |
- 2018** 2018 **Serum metabolites as diagnostic biomarkers for cholangiocarcinoma, hepatocellular carcinoma and primary sclerosing cholangitis**, Jesus M Banales, Mercedes Iñarrairaegui, Ander Arbelaiz, Piotr Milkiewicz, Jordi Muntane, Luis Muñoz-Bellvis, Adelaida La Casta, Luis M Gonzalez, Enara Arretxe, Cristina Alonso, Ibon Martínez-Arranz, Ainhoa Lapitz, Alvaro Santos-Laso, Matias A Avila, Maria L Martínez-Chantar, Luis Bujanda, Jose J G Marín, Bruno Sangro, Rocío I R Macías, *Hepatology*  
| [doi](#) | [pubmed](#) |

- 2018 **Obeticholic Acid Modulates Serum Metabolites and Gene Signatures Characteristic of Human NASH and Attenuates Inflammation and Fibrosis Progression in Ldlr<sup>-/-</sup>.Leiden Mice**, Martine C. Morrison, Lars Verschuren, Kanita Salic, Joanne Verheij, Aswin Menke, Peter Y. Wielinga, Marta Iruarizaga-Lejarreta, Laurent Gole, Wei-Miao Yu, Scott Turner, Martien P.M. Caspers, *Ibon Martínez-Arranz*, Elsbet Pieterman, Reinout Stoop, Arianne van Koppen, Anita M. van den Hoek, José M. Mato, Roeland Hanemaaijer, Cristina Alonso, Robert Kleemann, *Hepatology Communications*, Vol. 2, no. 12, 2018  
| [doi](#) | [abstract](#) | [pubmed](#) | [pdf](#) |
- 2018 **Anti-inflammatory and anti-fibrotic effects of obeticholic acid in Ldlr<sup>-/-</sup>.Leiden mice are paralleled by counterregulation of gene and metabolome signatures that are characteristic for human non-alcoholic steatohepatitis**, Martine Morrison, Lars Verschuren, Kanita Salic, Joanne Verheij, Aswin Menke, Peter Y Wielinga, Marta Iruarizaga-Lejarreta, Gole Laurent, Wei-Miao Yu, Scott Turner, Martien Caspers, *Ibon Martínez-Arranz*, Elsbet Pieterman, Reinout Stoop, Arianne van Koppen, Anita M van den Hoek, José M Mato, Roeland Hanemaaijer, Cristina Alonso, Robert Kleemann, *Translational Research*  
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- 2018 **Targeted UPLC-MS metabolic analysis of human faeces reveals novel low-invasive candidate markers for colorectal cancer**, Joaquin Cubiella, Marc Clos-Garcia, Cristina Alonso, *Ibon Martínez-Arranz*, Miriam Perez-Cormenzana, Ziortza Barrenetxea, Jesus Berganza, Isabel Rodríguez-Llopis, Mauro D'Amato, Luis Bujanda, Marta Diaz-Ondina, Juan M. Falcón-Pérez, *Cancers*  
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- 2018 **Metabolomic-based noninvasive serum tests to diagnose nonalcoholic steatohepatitis: Results from discovery and validation cohorts**, Rebeca Mayo, Javier Crespo, *Ibon Martínez-Arranz*, Jesus M Banales, Mayte Arias, Itziar Mincholé, Rocío Aller de la Fuente, Raúl Jimenez-Agüero, Cristina Alonso, Daniel A de Luis, Libor Vitek, Jan Stritesky, Joan Caballería, Manuel Romero-Gómez, Antonio Martín-Duce, Jose Maria Mugüerza Huguet, José Ignacio Busteros-Buraza, Michael O. Idowu, Azucena Castro, M Luz Martínez-Chantar, Pablo Ortiz, Radan Bruha, Shelly C Lu, Pierre Bedossa, Mazen Nouredin, Arun J. Sanyal, José M Mato, *Hepatology Communications* 2018 Jul; 2(7): 807-820  
| [doi](#) | [pubmed](#) | [pdf](#) |
- 2018 **Use of a Metabolomic Approach to Non-invasively Diagnose Nonalcoholic Fatty Liver Disease in Patients with Type 2 Diabetes Mellitus**, Fernando Bril, Laura Millán, Srilaxmi Kalavalalli, Michael J. McPhaul, Michael P. Caulfield, *Ibon Martínez-Arranz*, Cristina Alonso, Pablo Ortiz Betes, José M Mato, Kenneth Cusi, *Diabetes, Obesity and Metabolism*  
| [doi](#) | [abstract](#) | [pubmed](#) | [pdf](#) |
- 2017 **Role of aramchol in steatohepatitis and fibrosis in mice**, Marta Iruarizaga-Lejarreta, Marta Varela-Rey, David Fernández-Ramos, *Ibon Martínez-Arranz*, Teresa C Delgado, Jorge Simon, Virginia Gutiérrez-de Juan, Laura delaCruz-Villar, Mikel Azkargorta, José L. Lavin, Rebeca Mayo, Sebastiaan M. Van Liempd, Igor Aurrekoetxea, Xabier Buqué, Donatella Delle Cave, Arantza Peña, Juan Rodríguez-Cuesta, Ana M. Aransay, Felix Elortza, Juan M. Falcón-Pérez, Patricia Aspichueta, Liat Hayardeny, Mazen Nouredin, Arun J. Sanyal, Cristina Alonso, Juan Anguita, María Luz Martínez-Chantar, Shelly C. Lu, and José M. Mato, *Hepatology Communications*, Volume 1, number 9, November 2017, Pages 911-927  
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- 2017 **Serum extracellular vesicles contain protein biomarkers for primary sclerosing cholangitis and cholangiocarcinoma**, Ander Arbelaiz, Mikel Azkargorta, Marcin Krawczyk, Álvaro Santos-Laso, Ainhoa Lapitz, Maria J. Perugorria, Oihane Erice, Esperanza Gonzalez, Raúl Jimenez-Agüero, Adelaida Lacasta, César Ibarra, Alberto Sánchez-Campos, Juan P. Jimeno, Frank Lammert, Piotr Milkiewicz, Marco Marzoni, Rocío I.R. Macias, José J.G.Marin, Tushar Patel, Gregory J. Gores, *Ibon Martínez*, Félix Elortza, Juan M. Falcón-Pérez, Luis Bujanda, and Jesus M. Banales, *Hepatology*, Volume 66, issue 4, October 2017, Pages 1125-1143  
| [doi](#) | [pubmed](#) |
- 2017 **A Metabolomics Signature Linked To Liver Fibrosis In The Serum Of Transplanted Hepatitis C Patients**, Ainara Cano, Zoe Mariño, Oscar Millet, *Ibon Martínez-Arranz*, Miquel Navasa, Juan Manuel Falcón-Pérez, Miriam Pérez-Cormenzana, Joan Caballería, Nieves Embade, Xavier Forns, Jaume Bosch, Azucena Castro & José María Mato, *Scientific Reports* 7, article number: 10497.  
| [doi](#) | [pubmed](#) | [pdf](#) |
- 2017 **Metabolomic Identification of Subtypes of Nonalcoholic Steatohepatitis**, Alonso C, Fernández-Ramos D, Varela-Rey M, *Martínez-Arranz I*, Navasa N, Van Liempd SM, Lavin JL, Mayo R, Ilisso CP, de Juan VG, Iruarizaga-Lejarreta M, delaCruz-Villar L, Mincholé I, Robinson A, Crespo J, Martín-Duce A, Romero-Gomez M, Sann H, Platon J, Van Eyk J, Aspichueta P, Nouredin M, Falcón-Pérez JM, Anguita J, Aransay AM, Martínez-Chantar ML, Lu SC, Mato JM., *Gastroenterology*, Volume 152, issue 6, May 2017, Pages 1449-1461.e7  
| [doi](#) | [pubmed](#) | [pdf](#) |
- 2016 **Metabolically active extracellular vesicles released from hepatocytes under drug-induced liver-**

- damaging conditions modify serum metabolome and might affect different pathophysiological processes**, Felix Royo, Laura Palomo, Justyna Mleczko, Esperanza Gonzalez, Cristina Alonso, *Ibon Martínez-Arranz*, Miriam Pérez-Cormenzana, Azucena Castro, Juan M. Falcon-Perez, *European Journal of Pharmaceutical Sciences*, Volume 98, February 2017, Pages 51–57.  
| [doi](#) | [pubmed](#) |
- 2015** 2015 **Enhancing metabolomics research through data mining** *Martínez-Arranz, I., Mayo, R., Pérez-Cormenzana, M., Mincholé, I., Salazar, L., Alonso, C., José M Mato*, *Journal of Proteomics*, Volume 127 (Part B), September 2015, Pages 275–288.  
| [doi](#) | [pubmed](#) |
- 2015** 2015 **Data in support of enhancing metabolomics research through data mining** *Martínez-Arranz, I., Mayo, R., Pérez-Cormenzana, M., Mincholé, I., Salazar, L., Alonso, C., José M Mato*, *Data in Brief*, Volume 3, June 2015, Pages 155–164.  
| [doi](#) | [pubmed](#) | [pdf](#) | [web application](#) |
- 2013** 2013 **Excess S-adenosylmethionine reroutes phosphatidylethanolamine towards phosphatidylcholine and triglyceride synthesis**, Maite Martínez-Uña, Marta Varela-Rey, Ainara Cano, Larraitz Fernández-Ares, Naiara Beraza, Igor Aurrekoetxea, *Ibon Martínez-Arranz*, Juan L García-Rodríguez, Xabier Buqué, Daniela Mestre, Zigmund Luka, Conrad Wagner, Cristina Alonso, Richard H Finnell, Shelly C Lu, M Luz Martínez-Chantar, Patricia Aspichueta, José M Mato, *Hepatology*, Octubre de 2013. *HEPATOLOGY*, Vol. 58, No. 4, 2013  
| [doi](#) | [pubmed](#) | [pdf](#) |
- 2013** 2013 **Solute carrier family 2 member 1 (SLC2A1) is involved in the development of nonalcoholic fatty liver disease**, Vazquez-Chantada, M., Gonzalez-Lahera, A., *Martínez-Arranz, I.*, Garcia-Monzon, C., Maria Regueiro, M., Garcia-Rodriguez, J.L., Karin Anna Schlangen, Mendibil, I., Rodriguez-Ezpeleta, N., Lozano, J.L., Karina Banasik, Johanne M Justesen, Torben Joergensen, Daniel R Witte, Torsten Lauritzen, Torben Hansen, Oluf Pedersen, Nicolas Veyrie, Karine Clement, Joan Tordjman, Albert Tran, Yannik Le Marchand-Brustel, Xabier Buque, Aspichueta, P., Echevarria-Uraga, J.J., Martin-Duce, A., Caballería, J., Philippe Gual, Castro, A., Mato, J.M., Martínez-Chantar, M.L., Aransay, A.M., *Hepatology*, Febrero de 2013. *HEPATOLOGY*, Vol. 57, No. 2, 2013.  
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- 2012** 2012 **Metabolic profile associated with alcoholic hepatitis and the response to treatment. Preliminary results**, Javier Michelena, Cristina Alonso, José Altamirano, *Ibon Martínez-Arranz*, Ramón Bataller, MariaLuz Martínez-Chantar, Azucena Castro, Jose M. Mato, Juan Caballería, *Journal of Hepatology*, Volume 56, Supplement 2, Pages S535–S536.  
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- 2012** 2012 **Obesity dependent metabolic signatures associated with nonalcoholic fatty liver disease progression**, Barr, J., Caballería, J., *Martínez-Arranz, I.*, Domínguez Díez, A., Alonso, C., Muntané, J., Pérez Cormenzana, M., García Monzón, C., Mayo, R., Martín Duce, A., Romero Gómez, M., Lo Iacono, O., Tordjman, J., Andrade, R.J., Pérez Carreras, M., le Marchand Brustel, Y., Tran, A., Fernández Escalante, C., Arévalo, E., García Unzueta, M., Clement, K., Crespo, J., Gual, P., Gómez Fleitas, M., Martínez Chantar, M.L., Castro, A., S.C. Lu, Vázquez Chantada, M., Mato, J.M., *Journal of Proteome Research*, Febrero de 2012. *J. Proteome Res.* 2012, 11, 2521–2532  
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- 2011** 2011 **Unidad de Información sobre Pacientes Renales de la CAPV, 2009**, *Servicio Central de Publicaciones del Gobierno Vasco*, Depósito Legal: *Mayo de 2011*.
- 2009** 2009 **Unidad de Información sobre Pacientes Renales de la CAPV, 2008**, *Servicio Central de Publicaciones del Gobierno Vasco*, Depósito Legal: *BI-2458-09, Octubre de 2009*.
- 2009** 2009 **Unidad de Información sobre Pacientes Renales de la CAPV, 2007**, *Servicio Central de Publicaciones del Gobierno Vasco*, Depósito Legal: *BI-798-09, Abril de 2009*.
- 2008** 2008 **CERVANTES, Bateria Magallanes de Evaluación de la Inteligencia**, COHS, Consultores en Ciencias Humanas, *ISBN: 978-84-95180-17-9, Octubre de 2008*.  
| [ISBN](#) |
- 2008** 2008 **SÓCRATES, Protocolo Magallanes de Evaluación de Variables Moduladoras del Éxito Escolar**, COHS, Consultores en Ciencias Humanas, *ISBN: 978-84-95180-36-0, Diciembre de 2008*.  
| [ISBN](#) |
- 2007** 2007 **Unidad de Información sobre Pacientes Renales de la CAPV, 2006**, *Servicio Central de Publicaciones del Gobierno Vasco*, Depósito Legal: *BI-1067-08, Octubre de 2007*.
- 2007** 2007 **Unidad de Información sobre Pacientes Renales de la CAPV, 2005**, *Servicio Central de Publicaciones del Gobierno Vasco*, Depósito Legal: *BI-2871-07, Octubre de 2007*.  
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- 2006** 2006 **Unidad de Información sobre Pacientes Renales de la CAPV, 2004**, *Servicio Central de Publicaciones del Gobierno Vasco, Depósito Legal: BI-2020-06, Octubre de 2006.*
- 2006 **EMA-DDA, Escalas Magallanes de Detección de Problemas en el Desarrollo**, COHS, Consultores en Ciencias Humanas, *ISBN: 978-84-95180-26-1, Octubre de 2006.*  
| [ISBN](#) |
- 2006 **ESMIDAS, Escalas Magallanes de Identificación de Déficit de Atención en Niños, Adolescentes y Adultos**, COHS, Consultores en Ciencias Humanas, *ISBN: 978-84-95180-32-2, Octubre de 2006.*  
| [ISBN](#) |
- 2005** 2005 **Escala Magallanes de Inteligencia para Niños: EMIN-6**, COHS, Consultores en Ciencias Humanas, *ISBN: 978-84-95180-16-2, Agosto de 2005.*  
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- 2005 **Unidad de Información sobre Pacientes Renales de la CAPV, 2003**, *Servicio Central de Publicaciones del Gobierno Vasco, Depósito Legal: BI-1240-05, Octubre de 2005.*
- 2005 **Ley de Benford o Ley del Primer Dígito Significativo**, *Martínez Arranz, I., de la Torre Sebastián, L., SIGMA: Revista de Matemáticas, 26, pags 131-135 (ISSN 1311-7787), Mayo de 2005.*  
| [pdf](#) |

**R&D****LIVERBIOMARK**

**Desarrollo de biomarcadores del grado de fibrosis hepática y del pronóstico de pacientes con enfermedades hepáticas avanzadas mediante el uso de herramientas metabolómicas**, Expediente: IPT-010000-2010-013, Organismo financiador: Ministerio de Ciencia e Innovación, Programa: INNPACTO.  
OWL, MD Renal, CIC bioGUNE y Ciberhed

**BIODETECT**

**Nuevas tecnologías de detección de biomarcadores**, Expediente: ER-2010/00032, Organismo financiador: Gobierno Vasco, Departamento de Industria, Comunicación y Turismo, Programa: ETORGAI.  
Consorcio

**OSALIVER**

**OSALIVER**, Expediente: AB-2011/00209, Organismo financiador: Gobierno Vasco, Departamento de Industria, Comunicación y Turismo, Programa: COMPITE.  
OWL

**LIPIDSCORE**

**Diseño y desarrollo de un kit para el estudio lipídico exhaustivo de muestras biológicas por espectrometría de masas**, Expediente: IG-2012-0000346, Organismo financiador: Gobierno Vasco, Departamento de Industria, Comunicación y Turismo, Programa: GAITEK 2012.  
OWL, MD Renal

**PROYECTO NAFLD**

**PROYECTO NAFLD**, Expediente: 6/12/72/2012, Organismo financiador: Diputación Foral de Bizkaia, Programa: COMPETIR (INNOVACIÓN).  
OWL

**PATENTS GRANTED  
AND PENDING****W02021028562**

**Lipid signatures for determining the outcome of embryo implantation during in vitro fertilization**, The present invention relates to new methods for predicting the outcome of in vitro fertilization (IVF) procedures, as well as selecting the subjects to undergo IVF treatments. It also relates to methods for selecting IVF treatments and decision-making in said treatments as well as wash solutions for use in the treatment of infertility.  
ID Patent: PCT/EP2020/072846

**W02018007511**

**Diagnostic methods based on lipid profiles**, The present invention relates to methods for the diagnosis of NAFLD in a subject, and for the differential diagnosis of NASH or steatosis in a subject suffering from NAFLD, based on the determination in a sample of metabolic markers, particularly lipid metabolic markers.  
ID Patent: EP16382320.6

**W02018007422**

**Identification of human Non-Alcoholic Fatty Liver Disease (NAFLD) subtypes**, The present invention is directed to a profiling method for subtypes in non-alcoholic fatty liver disease (NAFLD) patients and to diagnostic methods within those subtypes to discriminate non-alcoholic steatohepatitis (NASH) versus steatosis patients.  
ID Patent: EP16382319.8 |

**W02017055397**

**Metabolomic signature of diagnosis and disease progression in Non-Alcoholic Fatty Liver Disease (NAFLD)**, The present invention is directed to a diagnostic method for non-alcoholic fatty liver disease (NAFLD) and to a method for monitoring the progression of the disease based on the determination of the levels of different metabolites. The invention also provides a method for determining the efficacy of an NAFLD therapy and a method for identification of compounds suitable for the treatment of NAFLD.  
ID Patent: EP15382477.6



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**Non-alcoholic fatty liver disease cardiovascular risk by metabolic subtype**, *Ibon Martínez-Arranz*, Chiara Bruzzzone, Rubén Gil-Redondo, Enara Arretxe, Marta Iruarizaga-Lejarreta, Maider Bizkarguenaga, Itziar Mincholé, David Fernández Ramos, Fernando Lopitz Otsoa, Rebeca Mayo, Nieves Embade, Elizabeth Newberry, Martine C. Morrison, Robert Kleemann, Libor Vitek, Radan Bruha, Rocío Aller, Javier Crespo, Manuel Romero Gomez, Jesus Maria Banales, Marco Arrese, Kenneth Cusi, Elisabetta Bugianesi, Samuel Klein, Mazen Nouredin, Shelly C. Lu, Quentin Anstee, Oscar Millet, Nicholas O Davidson, Cristina Alonso, José M. Mato, *Journal of Hepatology 2021 vol. 75(2) | S294-S803 | EASL ILC 2021 | ID: PO-916 |*

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## PROJECTS

### blog

I write a Data Science blog at [imarranz.com](http://imarranz.com) where I apply Mathematics, Python and R to open datasets and write-up the results and write about my experience in Data Science.

## LINKS

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Available on request.