



Consiglio Nazionale delle Ricerche
IFC - Istituto di Fisiologia Clinica

MAST4HEALTH Secondment Day (virtual meeting)

OXFORD

MAST4HEALTH

Secondment Day

Daniele Carpita

National Research Council (C.N.R.)

Institute of Clinical Physiology, Pisa, Italy



My discipline area and expertise

Area: Grant Management

Expertise: preparation of grant submission and report, management and administration plan





Secondment venue

Perspectum Diagnostics (PD) was founded in partnership with the University of Oxford in 2012 after a ground-breaking study demonstrated the potential of T1 mapping to predict liver fibrosis.

PD collaborate with expert clinical sites world-wide on a range of clinical research topics, in both adult and pediatric populations. These include fatty liver disease, biliary and autoimmune diseases, viral hepatitis and cancer.

PD work in partnership with the clinical and scientific community to use our technology to better understand liver disease and ultimately to improve care for patients.





Opportunities

Very good experience

Multidisciplinary and proactive working environment

Exchange of knowledge and practices on transversal issues

Exchange with international networks

Perspectum offer a flexible, fast-paced and fun environment





Activities

The staff of Perspectum Diagnostics showed and explained me the development of liver diseases and the several types of scores that are available to diagnose the hepatic damage focusing the attention on NAFDL

Acquired new skills and developed existing skills about:

Clinical data collection

Clinical data management and intellectual property

Protocol methodology used to analyze clinical data obtained from the Liver Multiscan exam





Networking

Involvement in European partnerships on issues of common interest
(e.g. research and innovation projects)





Suggestions

Monitoring and exchange
of possible **funding
opportunities** on common
issues



MAST4HEALTH

Secondment Day

Veronica Chiara Zuccalà
National Research Council (C.N.R.)
Institute of Clinical Physiology, Pisa, Italy



My discipline area and expertise

Area: Biomedical engineering

Expertise: Analysis of biomedical signals and images





Secondment venue

Perspectum Diagnostics LTD –
Oxford (UK)

The company delivers digital technologies that help clinicians to provide better care for patients with liver disease.

MAST⁴HEALTH





Opportunities

The secondment was an opportunity to gain professional experience in a company and to improve the personal English level.

MAST⁴HEALTH





Activities

- Training in the use of quantitative MRI (liver *MultiScan*) for analyzing NAFLD/NASH scans
- Analyzing of some trial MRI scans
- Contribution to the development of an automation software for the MRI scans analysis

MAST⁴HEALTH





Networking

Working toward the PhD degree

MAST⁴HEALTH



MAST4HEALTH

Secondment Day

Alessandro Mazzarisi

National Research Council (C.N.R.)
Institute of Clinical Physiology, Pisa, Italy



My Profile

Senior technician, co-author of many peer-reviewed articles and international conference papers

Area: Biomedical Engineering

Skills: Teamwork, public relations with government offices, knowledge on national industrial healthcare standards DICOM, HL7, IHE, UML storyboard writing.

Expertise: Ten-year experience developing national and regional e-Health regulations of Italian National Health Service projects at ministries.





Secondment

Perspectum Diagnostic Ltd, Oxford, UK
<https://perspectum-diagnostics.com/>



Member of the staff, involved in multi-organ MRI
uses of digital imaging techniques in humans.

Periods:

1st March 2018 – 30th March 2018

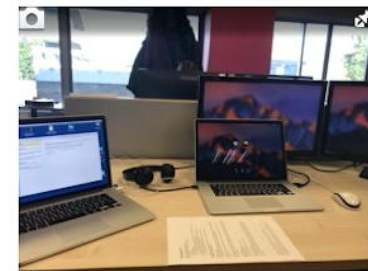
1st March 2019 – 30th March 2019





Opportunities

- Practice English language to improve comprehension and speech.
- Work as a member of the firm staff, to know more about how is a daily work at an innovative startup.
- Learn new techniques concerning MRI biomarkers through the Mast4Health project



Secondment Day - March 30,2020



Activities as secondeee

- 1) Trained in technologies developed by Perspectum Diagnostic Ltd. Performed segmentation of MR liver images to apply the analysis by LMS. Literature review and SWOT analysis of competitor firms.
- 2) Interviews with top management on the usability of MRI Biomarkers in the global market and Italy, opportunities and difficulties.
- 3) Writing articles for professional social networks about UK innovative startup lifestyle and professional opportunities.



Writing Activities



A success story: Perspectum Diagnostics Ltd - Oxford (UK)

Published on March 21, 2018 [Edit article](#) | [View stats](#)



La sfida di Perspectum Diagnostics Ltd. all HTC 2018

Published on May 12, 2018 [Edit article](#) | [View stats](#)



Startup, Innovazione, Medicina: alla scoperta della Biopsia Virtuale

Published on October 4, 2018 [Edit article](#) | [View stats](#)



Trip in Oxford 2019

Published on March 2, 2019 [Edit article](#) | [View stats](#)

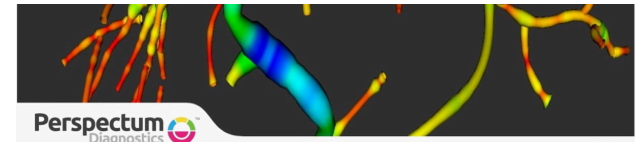


Secondment in Oxford - work in progress before Brexit



Osservare una startup da vicino

Published on April 6, 2018 [Edit article](#) | [View stats](#)



Perspectum Diagnostics

Stratification of Biliary Disease with Quantitative Magnetic Resonance Cholangiopancreatography (MRCP+)

MRCP+ for advanced biliary visualisation

Published on April 11, 2019 [Edit article](#) | [View stats](#)

Alessandro Mazzarisi
Senior Technician, Storyteller, LinkedIn Contributor

251 articles

LinkedIn is the place where I regularly talk at biomedical engineers, about the pros and cons of STEM careers opportunity, gender gap and company climate of Startups around the World.



Alessandro Mazzarisi Senior Technician, Storyteller, LinkedIn Contributor

Member since August 4, 2010

[Back to LinkedIn.com](#)



27048 connections

Premium Job Seeker



Networking

I introduced and helped a physicist and a project manager of Perspectum Diagnostics Ltd. to participate at a special prize called "AIIIC Health Technology Challenge AWARD - 2018" held in Rome from 9 to 12 May.

The Jury has evaluated the flagship product "LiverMultiScan" and innovative business model presented as one of the three best in the category "Development of technologies and devices for health".

On 11 May at 2.30 pm Angela Barone took her pitch.



Secondment Day - March 30,2020



Conclusions

The Oxford experience let me evaluate UK Startups opportunities to work abroad and their strategies to go to the marketplace, compared to Italian ones and the model of research institutions to work together better.



MAST4HEALTH Secondment Day

P. Salvo

National Research Council (C.N.R.)

Institute of Clinical Physiology, Pisa, Italy



My discipline area and expertise

Area: Bioengineering

Expertise:

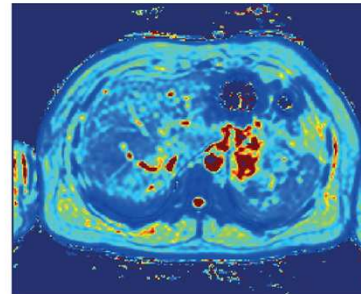
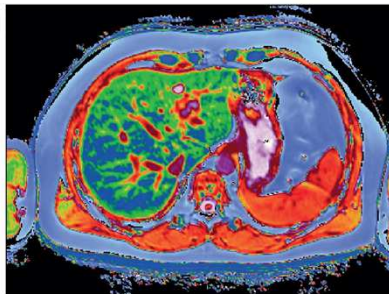
- Sensors & Biosensors
- Signal Processing
- Saliva and breath biomarkers
- Nanomaterials





Perspectum Diagnostics Ltd., Oxford, UK

Perspectum[®] is a medical imaging company born as spin off from Oxford University. Their software provide solutions for the identification and monitoring of metabolic diseases and cancer.



Perspectum[®] headquarters are in Oxford, home to the oldest university in the English-speaking world.





Opportunities

The secondment

- expanded my international relationships
- improved my knowledge on IPR
- gave me the opportunity to learn new techniques and be exposed to different expertise and backgrounds





Activities

- Image analysis to reconstruct the diameter of the biliary tract.
- Meetings on projects: *Hepatica v1 & v2* (Quantifying Liver Health in Surgical Candidates for Liver Malignancies), *Radical 1* (Non-Alcoholic Fatty Liver Disease by Fibroscan liver stiffness), *Radical 2* (Liver transplant in adult and paediatric patients); *METCOG* (prediction of metabolic risk and correlations with cognitive function in Mexican pre-pubertal Children).
- Group meetings and Journal Club meeting.
- Conference “Frontiers in Hepatology VIII – Alcohol & Non-Alcoholic Steatohepatitis (Kings College, London)



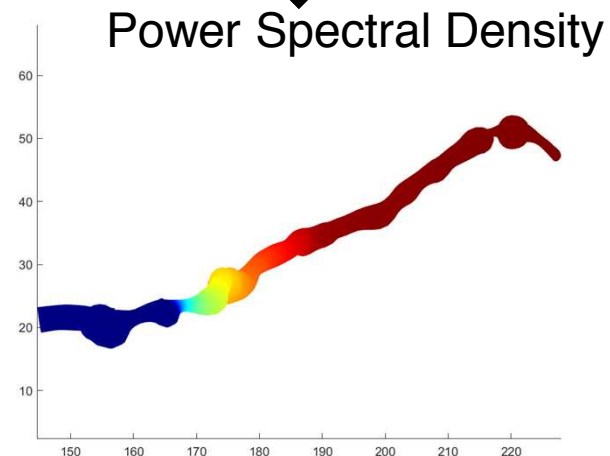
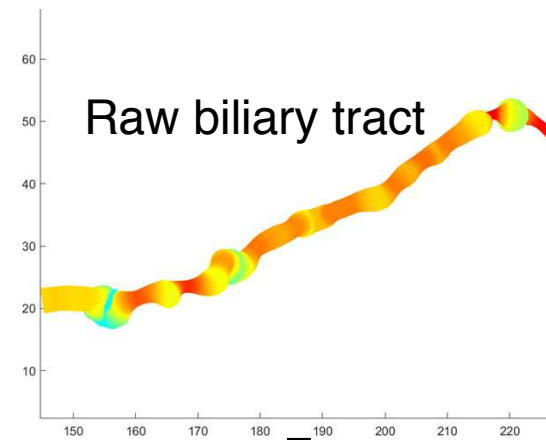
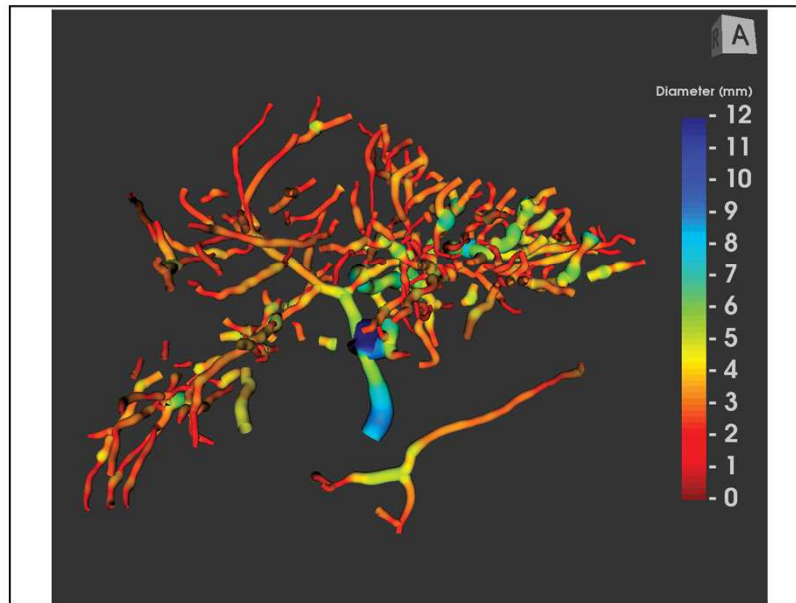
Example of application

Magnetic resonance cholangiopancreatography (MRCP) is used extensively in the evaluation of biliary tree anatomy.

Biliary system metrics^{1,3}

	Measured value	Reference interval
Biliary tree volume: ²	38.6ml	(1 - 9ml)
Gallbladder volume: ²	46.4ml	(7 - 40ml)
Percent of ducts with median width less than 3mm:	68%	(59 - 95%)
Percent of ducts with median width greater than 3mm up to 5mm:	30%	(3 - 37%)
Percent of ducts with median width greater than 5mm up to 7mm:	2%	(0 - 14%)
Percent of ducts with median width greater than 7mm:	1%	(0 - 3%)

Quantitative biliary tree model





Networking

Perspectum CEO is willing to collaborate in the future with the Institute of Clinical Physiology. In particular, it was discussed about the possibility to start a Ph.D. about the use of their technology to investigate the cardiac tissue after surgery or a medical treatment, and in case of conditions (e.g. diabetes) that can affect the cardiac output.

MAST⁴HEALTH





Activities



Hospital Name

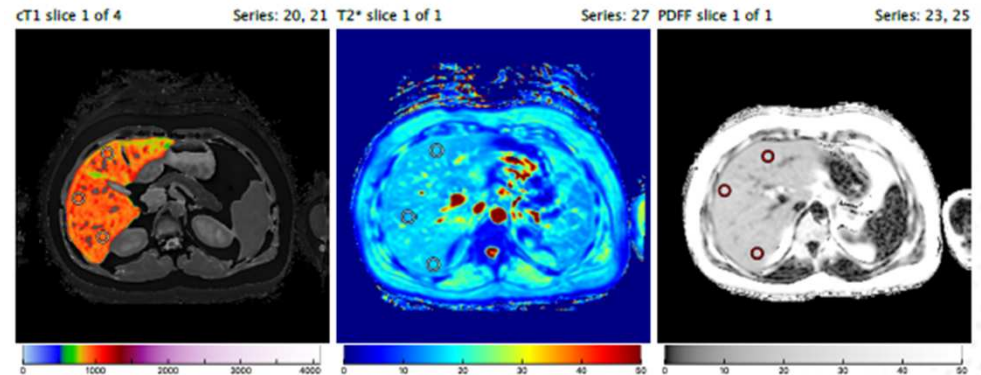
Address line 1

Address line 2

Patient name:	Anonymous	Scan date:	2017-Jul-06
Patient ID:	Anonymous	Scan time:	16:39
Sex:	Male	Referring physician:	Not recorded
Birth date:	1970-Jan-01	Other:	Multislice acquisition

Metrics are displayed as median with interquartile range (IQR) and are calculated from multiple regions of interest over potentially more than one slice. The slices below are examples from the acquisition. Slices are shown on subsequent pages, with more detailed analysis. Please refer to 'A Guide to interpreting Liver Tissue Characterization for Clinicians' available from the Manufacturer.

Liver ROI cT1 (ms)	Liver ROI T2* (ms)	Liver ROI PDFF (%)
Median: 937ms	Median: 15.8ms	Median: 20.4%
IQR: 903 to 975ms	IQR: 15.1 to 16.3ms	IQR: 19.4 to 22.4%
Ref range: 633 to 794ms	Reference: >12.5ms at 3T*	Reference: <5.6%
<small>cT1 is corrected for iron and field strength*</small>	<small>T2* is dependent on field strength</small>	<small>PDFF generated with the IDEAL method</small>



Colormaps serve purely as a visual aid and shall in no way be considered indicative of a diagnostic decision. The clinician must be cautious when interpreting cT1 and, in particular, be aware of the non-meaning of color.

Thank you!

“This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 691042”

Secondment Day - March 30,2020



MAST4HEALTH

Secondment Day

Maria Giovanna Trivella
National Research Council (C.N.R.)
Institute of Clinical Physiology, Pisa & Milano, Italy



My discipline area and expertise

MD, Cardiologist, Senior Researcher
Expertise & Competences

Multidisciplinary research activity:
experimental research, cardiovascular
diseases, personalised medicine,
bioengineering, medical devices,
animal care, regulatory affairs,
bioethics, interdisciplinary &
translational research





Secondment Venue: Oxford, UK at Perspectum Diagnostics Ltd.

<https://perspectum-diagnostics.com/>

Medical imaging company founded as a spin-out from Oxford University in **2012** Perspectum® headquarters are in Oxford

May 31st, 2019 Perspectum has opened an office in Dallas, Texas → for *LiverMultiScan*, FDA-cleared, non-invasive, quantitative MRI-based service

October 1, 2018 *LiverMultiScan™* receives regulatory clearance in Singapore for exponential increase in Non-Alcoholic Fatty Liver Disease (NAFLD) in the region → studies estimate that 1 in 4 Singaporeans is suffering from NAFLD (Goh *et al.* 2016, Perceptions of non-alcoholic fatty liver disease - an Asian community-based study. Gastroenterology report)



Perspectum Diagnostics Ltd. & MAST⁴HEALTH

Data analysis of fat and fibrosis content by quantitative liver magnetic resonance (*LiverMultiScan*) of patients enrolled by a multicenter randomized double-blind placebo-controlled (parallel arm) clinical trial



to evaluate the efficacy of Mastiha supplement in NAFLD/NASH patients by analysing NMR images at the baseline and after six months of treatment or placebo





Activities (I)

Evaluation and discussion on the trial performed in Milano,
→to have a complete picture of the data acquisition, quality and analysis of the Liver Multi Scan images sent from the clinical centre

Teleconference of the Consortium partners →

- to define a data analysis plan
- to discuss the main paper content
- to check other possible manuscripts on collateral data
 - microbioma variability
 - software packages

A first proposal of the title “Big Data in nutritional trial: the MAST4HEALTH Project and of a schematic index has been written and sent to the Coordinator





Activities (II)

Participation to a Journal Club meeting: “Hypertension, diabetes, atherosclerosis and NASH: Cause or consequence?” General discussion on the undefined links from diabetes and NAFLD

Participation to Frontiers in Hepatology VIII “Alcohol & Non-Alcoholic Steatohepatitis” (Venue: The Institute of Hepatology London; October 8, 2019; Perspectum Diagnostics sponsor among others)

Participation to General Meetings →

Knowing Perspectum Organization: 3 geographical locations UK (Oxford) US (San Francisco, Dallas) Asia (Singapore).

Three lines: two commercials, products and diagnostic devices for clinical activities, one new line of research (time frame 2 years!)



Personal Evaluation & Perspective for Future Cooperation

The time at Perspectum it has been a real experience. They are very competent people, inducing enthusiasm and stimulating ideas for the future.

By considering the research scenarios of IFC and in general of CNR it appears possible to suggest networking activities and future cooperation in the field of cardiology.

NMR images of heart could give information about heterogeneity of cardiac tissues in different diseases before and after treatment (interventional, medical treatment etc...) as well as microcirculatory impairment (diabetes, cardiomyopathies, heart transplantation and rejection phases...).

MAST⁴HEALTH

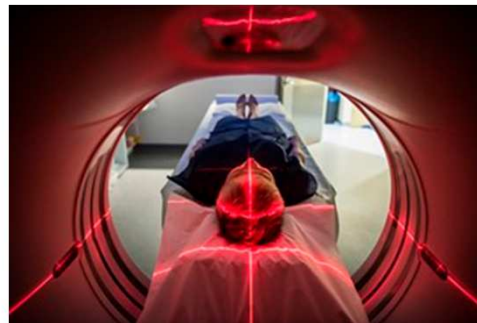




OXFORD
UK



Thank You



“This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 691042”

Secondment Day - March 30,2020

MAST₄ HEALTH

Secondment Day

Raffaele Conte

National Research Council (C.N.R.)
Institute of Clinical Physiology, Pisa, Italy



My profile

M.Sc. in Computer Science

Head of ICT Team and

Contact person for data protection and privacy issues

@ Institute of Clinical Physiology -
National Research Council

Main activities:

Health Information System development

Personal Data management

Digital Identities





Secondment

Venue:

Perspectum Diagnostic Ltd, Oxford, UK

<https://perspectum-diagnostics.com/>



Period:

22nd October - 22nd November 2020



Perspectum

Main product:

LiverMultiScan

a diagnostic tool for liver disorders that uses multiparametric Magnetic Resonance Imaging (MRI) to quantify liver tissue



Activity as secondeee

MAST₄HEALTH

Interviews and presentations with company apex roles for discussion on management of:

- software development activities, methods and tools
- project management
- IT security and data protection management



Project management



Angela Barone: Technical Project Manager for Mast4Health project

Discussion about:

- role of Perspectum Diagnostic in Mast4Health;
- tools for project management:

◆ Jira Software by  **ATLASSIAN**

In our project development (InGene, WiFi, WellDone...) we are now testing Jira





Project management



John Garratt: Product Manager for “Edison”

Electronic Data Imaging Solution (EDISON) is the PD secure cloud base portal for enabling clinicians to upload or send MR studies and enabling experts analysts to deliver *LiverMultiScan*[®] reports

<https://youtu.be/a40a8JWGOHg>

Edison has similarities with software developed for QualiMedLab SpinOff





Security management



Aswathy Mohanaprakas: Head of Information Security

Discussion on:

- security policy applied to the IT infrastructure
- application of GDPR (675/2016/EU)
- digital identities management

There several common problems on security management. PD doesn't implemented a centralized Identity Manager (as IdeA for IFC).





Security management

Marta Guimaraes: Information Security Manager

Marta conducts and explained auditing for:

- ISO Certification security
- Application of GDPR (675/2016/EU)
- Procedure for secure software development





Software development



Kevin Dixon: Head of Software Engineering

Kevin is the responsible for end-to-end delivery of software products and services, technical architecture and team development for product as *LiverMultiScan*® and Edison.

Procedure and solutions has been discussed because of common issues for software development (i.e. InGene platform).





Product management



Roberto Salvati: Senior Imaging Applications Specialist

Roberto performs installation of PD software on Siemens, Philips and GE scanners, helps the Data Analyst in the MR artifact guidance and provides help to remote PD sites

He illustrated several use cases of installations of *LiverMultiScan*[®] on clinical sites where some situation may be similars to ours.





Conclusions



The “Oxford experience” has been very useful in order to evaluate and compare our way of developing software as well as managing security aspects, compared to a private international company.



Thank you!



“This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 691042”

Secondment Day - March 30, 2020