Coffee with EMBL – **15 October 2021, The Future of AI in Life Sciences (Part 2)**
Recording is available here.

Moderator:
- • **Angus Lamond**, Professor, University of Dundee and former EMBL Group Leader and Senior Scientist

Co-organiser:
- **Thomas Vaccari,** Associate Professor, University of Milan and former EMBL Predoc

Guests:
- • **Alvis Brazma**, Functional Genomics Senior Team Leader and Senior Scientist, EMBL-EBI.
- • **Søren Brunak**, Research Director, Novo Nordisk Foundation Center for Protein Research
- • **Uwe Dengler**, Data Scientist and postgraduate at MIT Sloan School of Management, Cambridge, MA
- • **Chris Sander**, Professor, Harvard Medical School, Boston

Announcements:
- **The Future of AI in Life Sciences (Part 3):** Friday 16 July, 16:00-18:30 hrs CET
  Register now!

Links shared during the chat:
- **Alvis Brazma** on "Klara and the Sun" by Kazuo Ishiguro:
  https://en.wikipedia.org/wiki/Klara_and_the_Sun
- **Andrew Cowley** on "The AI does not hate you" by Tom Chivers:
  https://www.goodreads.com/book/show/44154569-the-ai-does-not-hate-you
- **Satyavati Kharde** on "Transforming healthcare with AI: The impact on the workforce and organizations": https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/transforming-healthcare-with-ai
- **Satyavati Kharde** on "Digital Health Ecosystems: Voices of key healthcare leaders": https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/digital-health-ecosystems-voices-of-key-healthcare-leaders
- **Chris Sander** on "Pancreatic cancer risk predicted from disease trajectories using deep learning": https://www.biorxiv.org/content/10.1101/2021.06.27.449937v1

Chat from session

Data standardisation and privacy
00:51:48   **Thomas Vaccari**, Milan, Italy: How is data standardization and privacy coming into play here?
00:53:51   **Uwe Dengler**, PhD, Heilbronn: Very good question Thomas, just wanted to ask in the same direction. Even within a single organization this often is a challenge. Especially how to handle Patient privacy is in my view still unsolved.

01:02:34   **Andrew Cowley** (Cambridge, UK):   There has been quite a lot of talk about data from wearables (and just about every kind of measurable) at bioData conferences over the last few years.

01:03:59   **Thomas Vaccari**, Milan, Italy: @Andrew: that sounds very scary!

01:06:03   **Hridayesh Prakash**:   I think that AI is fancy stuff and does not require much setup. We should use this in limited dimension ...and does not guide machine to misguide us..

01:06:47   **Andrew Cowley** (Cambridge, UK):   The analogy is with car sensors - they tell you that a service is needed before something goes more seriously wrong. We probably have enough data from wearables to do similar.

01:08:48   **Björn Fritz**, Heidelberg: Working in a global pharmaceutical company doing clinical trials in many countries there is a huge cultural difference when it comes to deal with personal data. In Israel there are companies using AI to identify patients suited for trials. The patients are given them away. In Germany on the other hand there are 17 different data protection authorities not aligned. Very difficult

Risks and Responsibility

01:14:51   **Uwe Dengler**, PhD, Heilbronn: Do we have to sue someone? Presumably without the algorithms the results would have been even worse or nothing would have happened, no action taken. Usually it is a combination of human experts and AI.

01:23:44   **Ana Esther Mijovilovich**:   "danger from human" vs "danger from machines" is a dangerous comparison because we will end delegating to machines other activities that we may not like to. Probably human driving (or whatsoever activity) assisted by machines will still put the responsibility on the human and solve accountability issue.

01:25:23   **Bodo Lange** - Berlin - Alacris: Is AI not likely to fail on complex multifactorial diseases such as cancer as mentioned by Soren (IBM's Watson failed here). Will we not need Systems Biology approaches and mechanistic modelling to find better treatment for cancer patients (maybe in combination with AI)?

01:27:22   **Thomas Vaccari**, Milan, Italy: I think experimental science will still be needed but one could see it as ways of feeding algorithms with new data inputs

01:28:41   **Alvis Brazma**: The experiments will be done by robots :-)

01:28:49   **Andrew Cowley** (Cambridge, UK):   Humans see correlations and make conclusions from non-exhaustive data from the day we are born, and we get it wrong sometimes too. I don't see a reason AI/ML can't do the same - is it time to move away from scientific method?

AlphaFold

01:28:57   **Mauno**:   A note about AlphaFold and RoseTTAFold. They did not solve the folding problem. They are able to predict structures with quite high accuracy. However, the programs do not know why the proteins fold the way they do.

01:29:30   **Alvis Brazma**: Not yet :-)

01:30:11   **Chris Sander** Harvard Med: We published learning for protein-protein interactions in 2014, as did David Baker - works

01:31:24   **Björn Fritz**, Heidelberg: totally agree with Uwe. Working for 15 years with Abbvie and we have not solved it either ;)

01:31:56   **Mauno**:   AI is excellent in learning from data, however, it does not understand how proteins fold. Neither do we when using and developing these tools. The fact that AI predictors work does not make us any smarter.

AI in health care / Data centralisation

01:35:21   **Mark Green** - Hertford UK: We assume that AI will improve health care. What if the Minister for Health sees an opportunity to have a highly standardised, centralised system with specific outcomes based solely on patient genetics/data. Would this be a good or a bad thing?

01:36:38   **Manuela Helmer Citterich**:   Hari Seldon had already understood everything ;))

01:37:56   **Ana Esther Mijovilovich**:   the possibility to centralize too much information on one place gives a lot of power to those with access to the info. The main challenge is not for us scientists how to use AI but for legislators and sociologists about the societal impact.

01:49:14   **Pedro Guillem**:   What is the position of the panel regarding anonymity?. It wouldn't prevent some companies (or institutions) from monopolizing information, for example, but it would unlink the citizen from the scientific goal: which is to train a model.

01:56:06   **Fatima Gebauer**, Barcelona: Bye people, I have to leave. Thank you for the wonderful discussion!. It has been a joy to see you all.