Celebrating ERC-10 in Europe and beyond

European Research Council
Established by the European Commission

Key figures

7,000
top researchers funded

50,000
researchers & other professionals hired in ERC teams

with **€12 billion**

Breakthroughs

73%
of completed projects led to breakthroughs/major advances

Scientific impact

> 5,500
articles among 1% most cited scientific journals

Open to the World

9
international initiatives for non-EU talent to join ERC teams

Prestigious prizes, e.g.

6 Nobel Prizes
5 Wolf Prizes
4 Fields Medals

ERC as model

15
EU countries set up ERC-like structures/funding schemes

Celebrating ERC-10 in Leiden

European Research Council
Established by the European Commission

Leiden University & LUMC

Starting grants	37
Consolidator grants	15
Advanced grants	26
Proof of concept grants	6
Synergy grants	2

Twitter: #ERC10yrs

Universiteit Leiden

Cu4Energy:

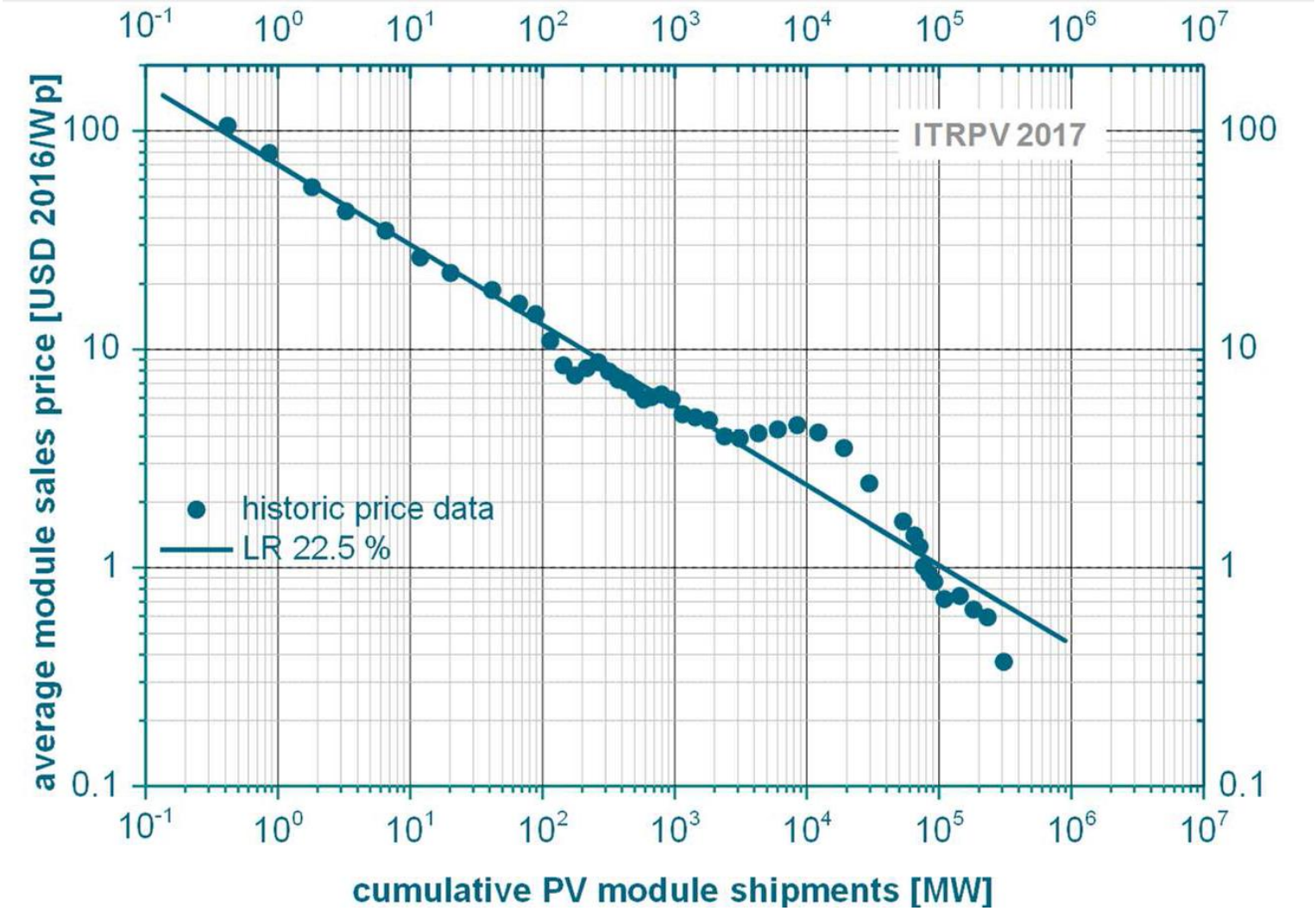
Copper Catalysts for a Sustainable Future

European Research Council

Established by the European Commission

Dennis Hetterscheid

Future of Energy



Source: *International Technology Roadmap for Photovoltaic* **2016**

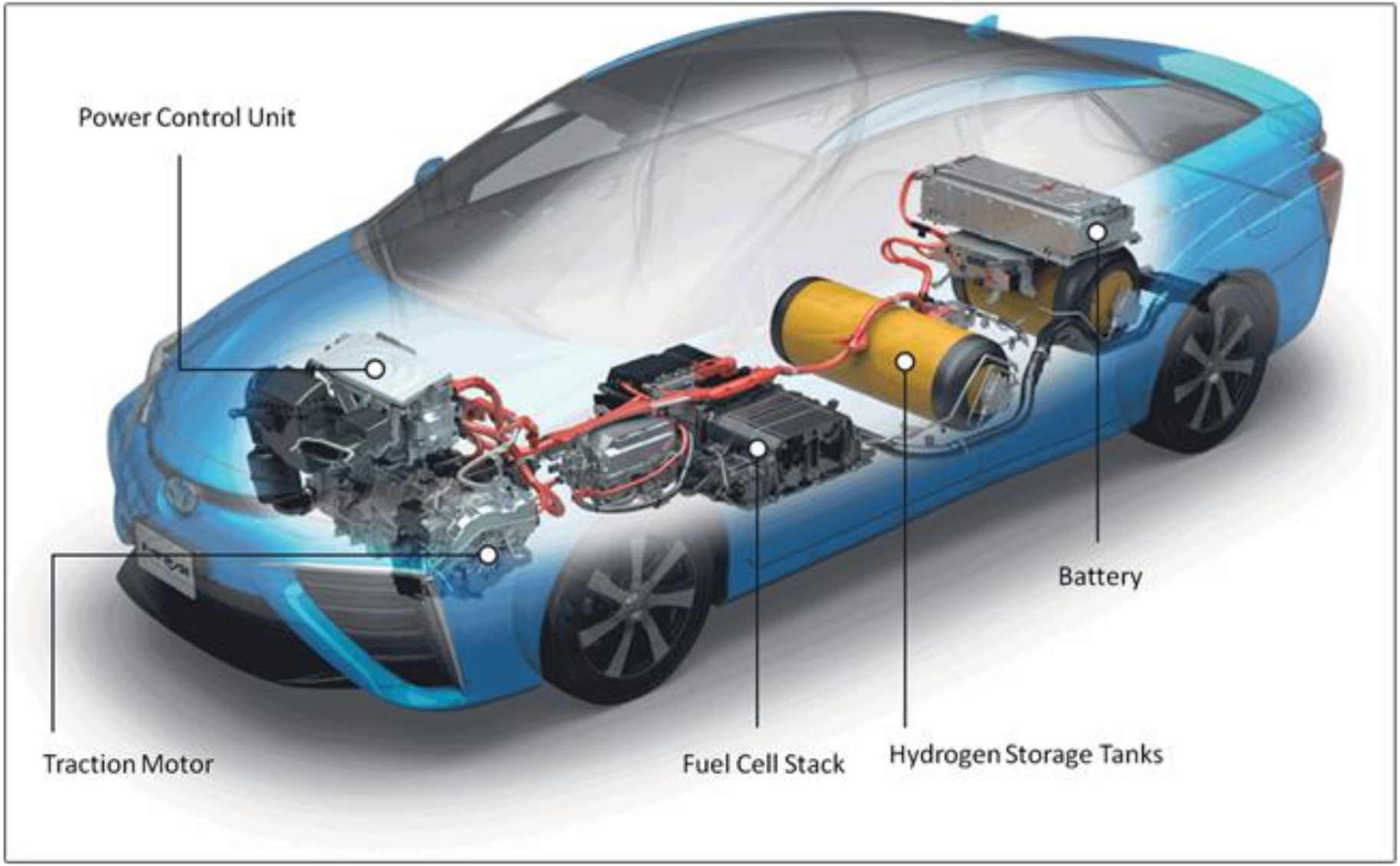
Making Fuel (H_2) from Electricity

$$2\,H_2O \rightleftharpoons O_2 + 4H^+ + 4e$$

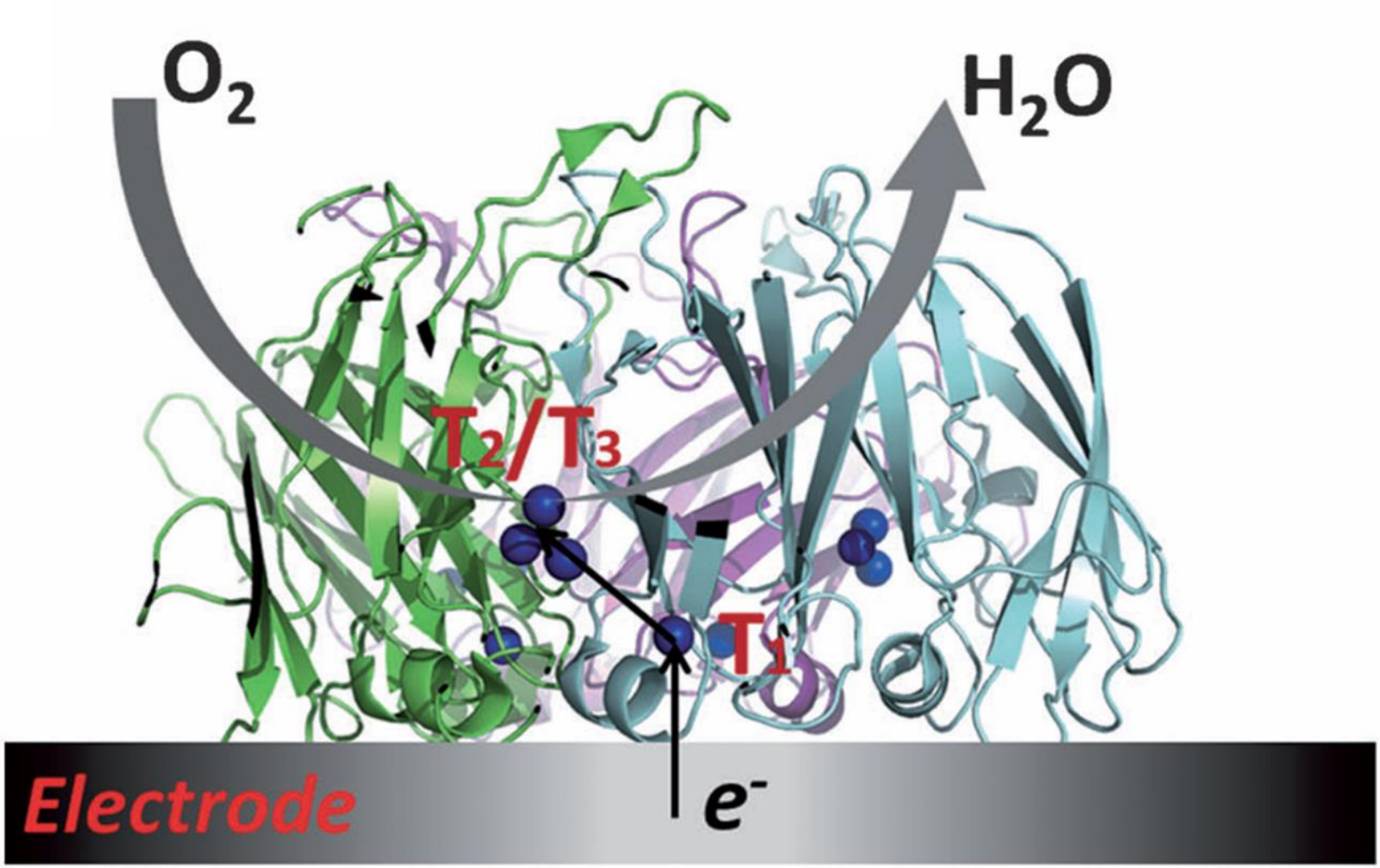
$$4H^+ + 4e \rightleftharpoons 2H_2$$

$$2H_2O \longrightarrow 2H_2 + O_2$$

Making Electricity from Fuel

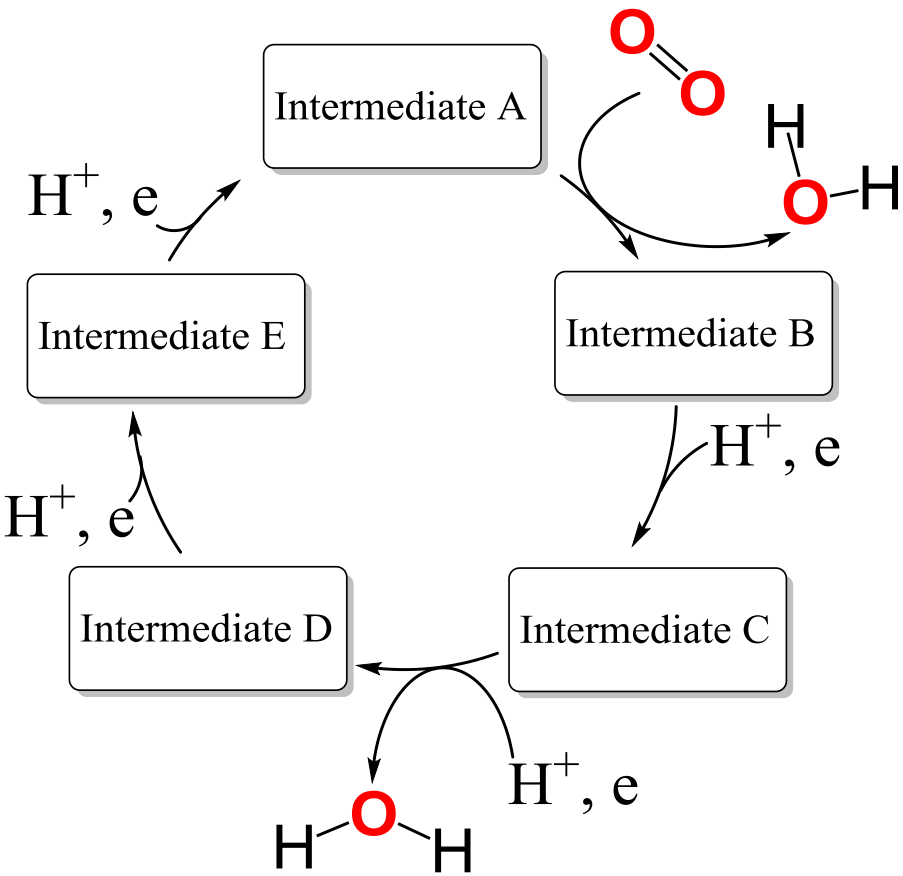


Nature: Enzymes are very efficient



The ideal catalyst

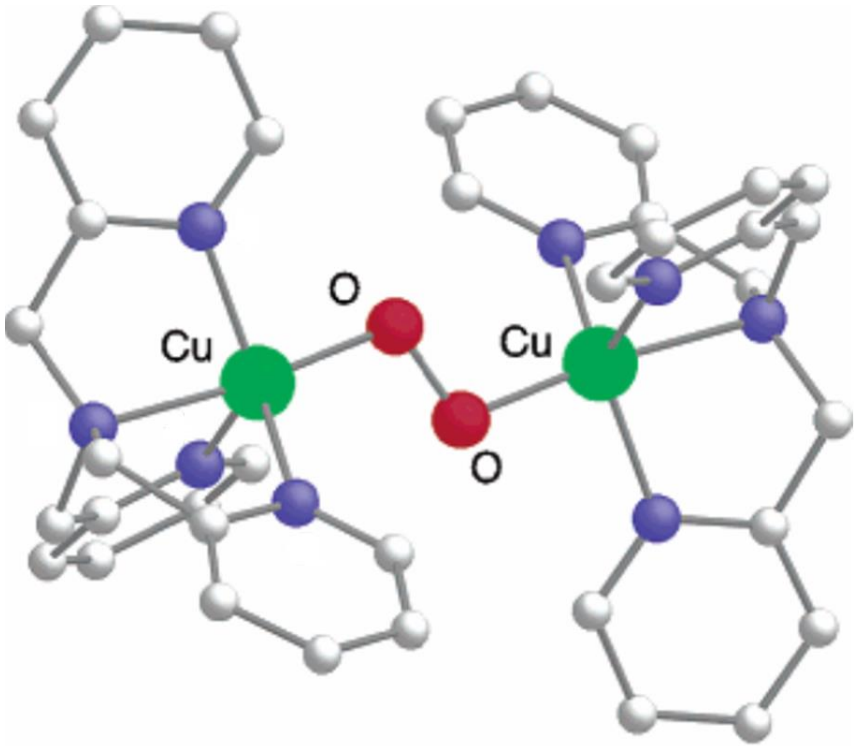
High catalytic rates at a low driving force



- Abundant materials
- All redox reactions should be equally difficult
- O_2 binding should be fast
- Cleavage of the O-O bond should be facile

Goals of the ERC project:

Understand multi-electron redox catalysis

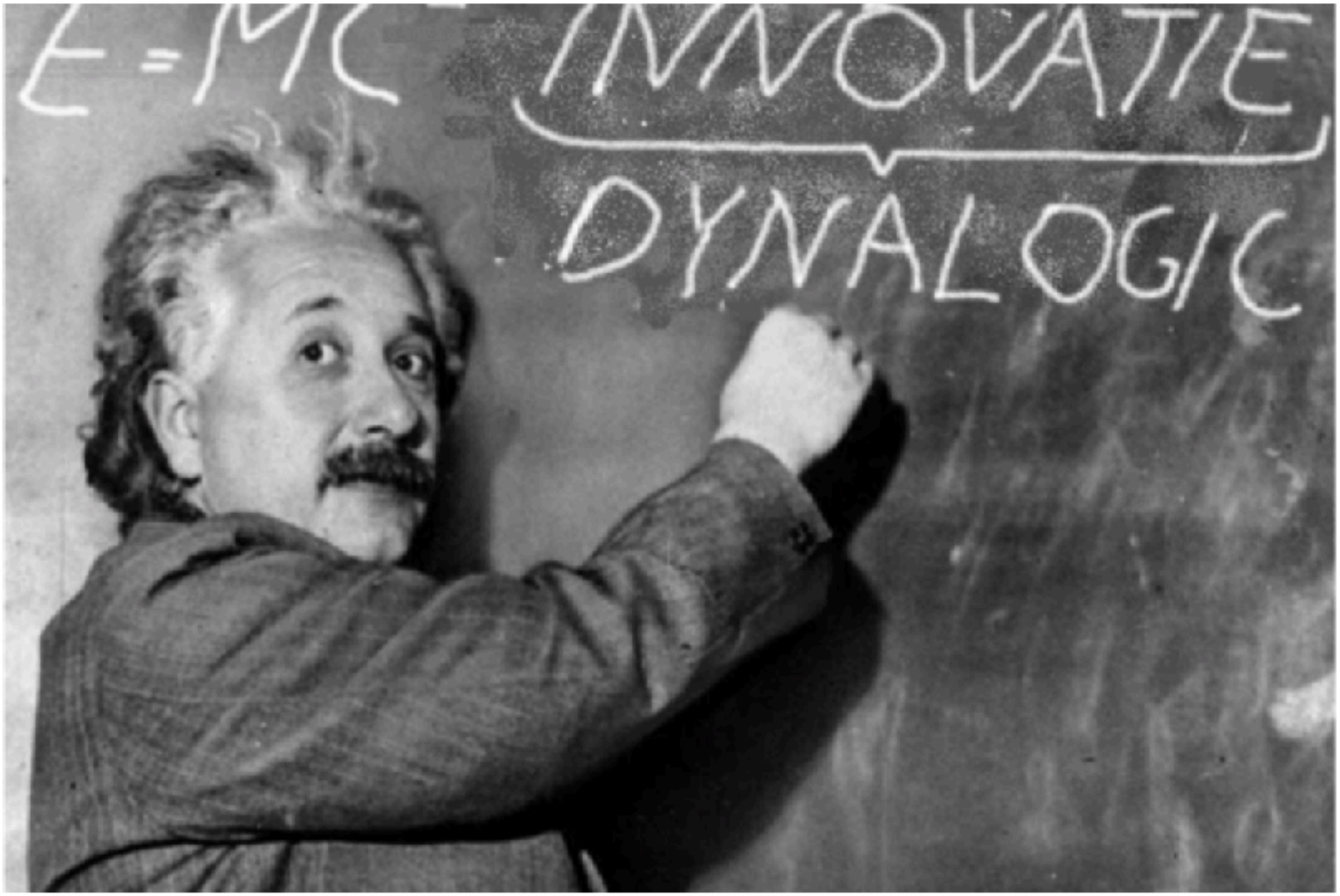


- How does Laccase Work?
- Synthetic Copper complexes
- Structure – Activity Correlation
- In operando characterization of the catalytic species and the product(s)
- Reversibility
- *But <u>not</u> making fuel cells*

Expected Outcome

- Fundamental understanding
- Explicit design criteria for the ideal catalyst
- Allow for rational development of catalysts that we need four our future sustainable society

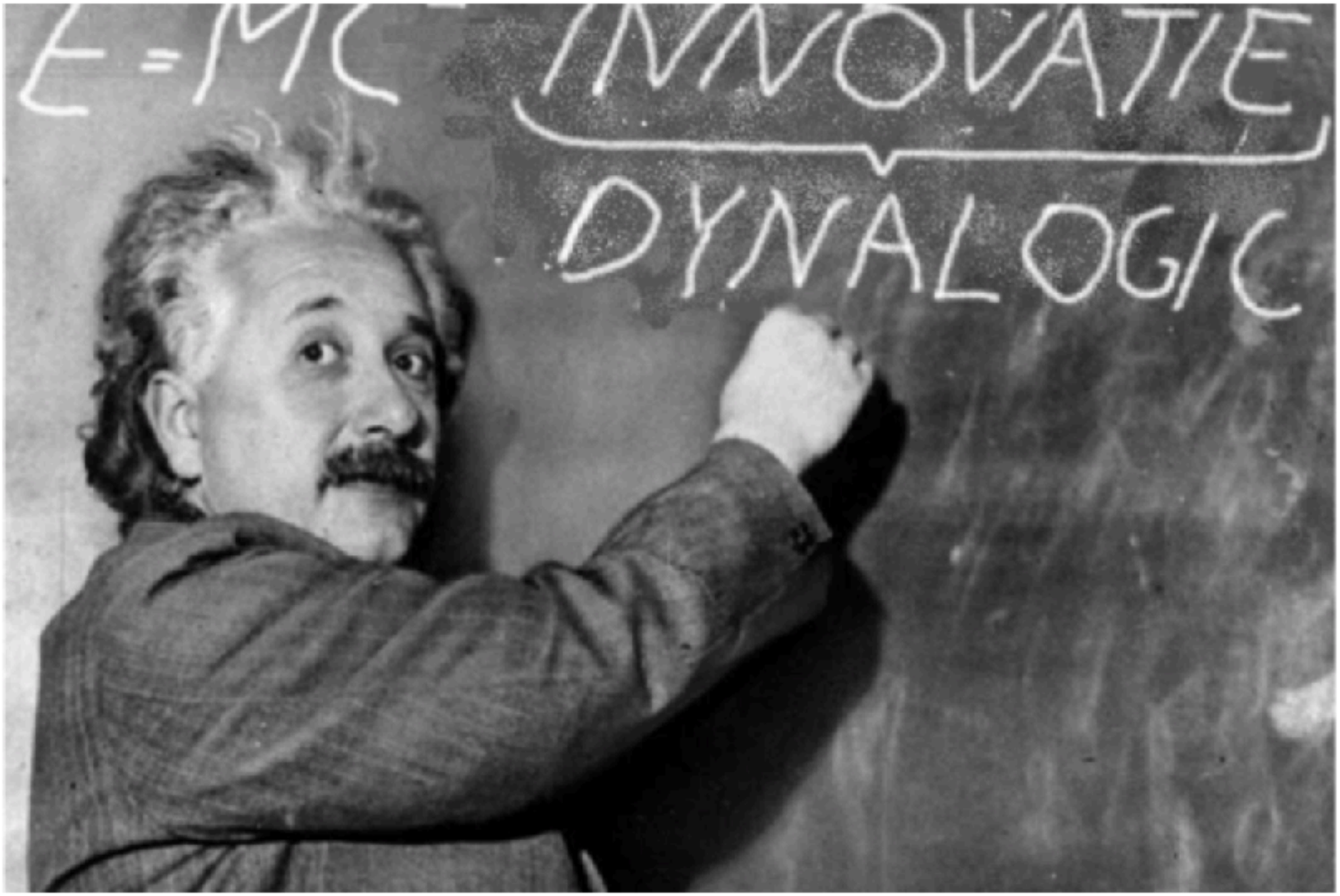
ADVALVAS
ONAFHANKELIJK PLATFORM VAN DE VRIJE UNIVERSITEIT AMSTERDAM



Wetenschap

'Einstein zou nooit een NWO-beurs krijgen'

ADVALVAS
ONAFHANKELIJK PLATFORM VAN DE VRIJE UNIVERSITEIT AMSTERDAM



Wetenschap

Einstein zou vast een ERC beurs krijgen!

~~'Einstein zou nooit een NWO-beurs krijgen'~~

WHY EINSTEIN WOULD BE A GREAT MATCH FOR AN ERC GRANT

Theory of curved space-time

Dr. Albert Einstein

patent office, Bern, Switzerland

We propose to investigate the idea that space is curved around a massive object. Building on our previous theory of space-time, we will develop a fundamental theory of gravity. We expect that this can explain small deviations observed in the motion of the planets, and hope that ultimately our theory can explain the origin of the Universe.

Theory of curved space-time

Dr. Albert Einstein

patent office, Bern, Switzerland

We propose to investigate the idea that space is curved around a massive object. Building on our previous theory of space-time, we will develop a fundamental theory of gravity. We expect that this can explain small deviations observed in the motion of the planets, and hope that ultimately our theory can explain the origin of the Universe.

WHY EINSTEIN WOULD BE A GREAT MATCH FOR AN ERC GRANT

the three P's:

Theory of curved space-time

Dr. Albert Einstein

patent office, Bern, Switzerland

We propose to investigate the idea that space is curved around a massive object. Building on our previous theory of space-time, we will develop a fundamental theory of gravity. We expect that this can explain small deviations observed in the motion of the planets, and hope that ultimately our theory can explain the origin of the Universe.

WHY EINSTEIN WOULD BE A GREAT MATCH FOR AN ERC GRANT

the three P's:

a successful ERC grant

Theory of curved space-time

Dr. Albert Einstein

patent office, Bern, Switzerland

We propose to investigate the idea that space is curved around a massive object. Building on our previous theory of space-time, we will develop a fundamental theory of gravity. We expect that this can explain small deviations observed in the motion of the planets, and hope that ultimately our theory can explain the origin of the Universe.

WHY EINSTEIN WOULD BE A GREAT MATCH FOR AN ERC GRANT

the three P's:

a successful ERC grant

- *resonates with your* ***P****eers*

Theory of curved space-time

Dr. Albert Einstein

patent office, Bern, Switzerland

We propose to investigate the idea that space is curved around a massive object. Building on our previous theory of space-time, we will develop a fundamental theory of gravity. We expect that this can explain small deviations observed in the motion of the planets, and hope that ultimately our theory can explain the origin of the Universe.

WHY EINSTEIN WOULD BE A GREAT MATCH FOR AN ERC GRANT

the three P's:

a successful ERC grant

- *resonates with your **P**eers*
- *builds on a **P**ilot project*

Theory of curved space-time

Dr. Albert Einstein

patent office, Bern, Switzerland

We propose to investigate the idea that space is curved around a massive object. Building on our previous theory of space-time, we will develop a fundamental theory of gravity. We expect that this can explain small deviations observed in the motion of the planets, and hope that ultimately our theory can explain the origin of the Universe.

WHY EINSTEIN WOULD BE A GREAT MATCH FOR AN ERC GRANT

the three P's:

a successful ERC grant

- *resonates with your **P**eers*
- *builds on a **P**ilot project*
- *opens up a new **P**erspective*

Rijksdienst voor Ondernemend Nederland

10 years of ERC grants

A success story for the Netherlands

10 years of ERC: A European success story

- Around **7,000 "Principal Investigators"** and over 50,000 team members funded with **€12 billion Euro**
- **6 Nobel Prizes**, 4 Fields Medals and dozens of important prizes awarded to ERC grantees
- **100,000 articles** published in scientific journals, including over 3,000 articles in the 1% most cited scientific journals
- Over 180 researchers **moved to Europe** with the ERC grant, of which most are returning Europeans.
- ERC projects have led to over **800 patent applications** and over 75 new ventures

10 years of ERC: A Dutch success story

Over **1 billion euro** awarded to **Dutch institutions**

NL ranks 4th in number of granted ERC projects, with **672 ERC projects** awarded

Attracting **181 top talents** from abroad

74 Projects exploring **Commercial Application**

Projects **ranging** from **black holes** to understanding **positive emotions**

Statistics – *Success rates*

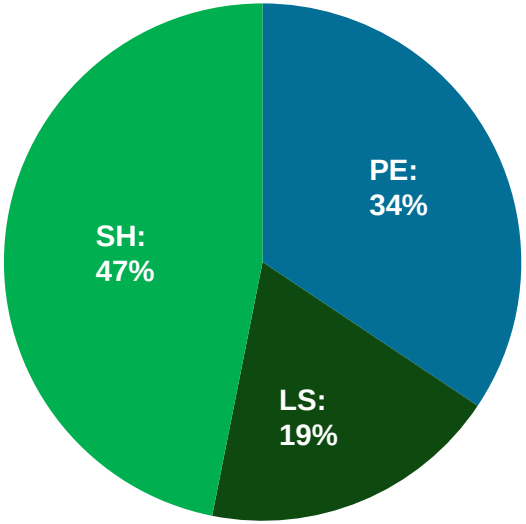
		Success rates	
		EU	NL
StG	*2015*	12,2%	
	2016	13,0%	
CoG	*2015*	14,9%	
	2016	13,6%	
AdG	*2014*	8,5%	
	2015	14,4%	

Statistics – *Success rates*

		Success rates	
		EU	**NL**
StG	*2015*	12,2%	19,4%
	2016	13,0%	16,8%
CoG	*2015*	14,9%	23,8%
	2016	13,6%	19,9%
AdG	*2014*	8,5%	12,2%
	2015	14,4%	17,8%

ERC @Leiden

(awarded)
33 Starting Grants
10 Consolidator Grants
21 Advanced Grants
6 Proof of Concept Grants



➔ 47% in SH

most awarded areas:

- PE 9 'Universe Sciences' (8 projects) and PE5 'Synthetic Chemistry and Materials' (6 projects)
- SH6 'The Study of the Human Past' (12 projects) and SH4 'The Human Mind and Its Complexity' (8 projects)
- LS7 'Diagnostics, Therapies, Applied Medical Technology and Public Health' (7 projects)

Synergy Grant: A Dutch (*and* Leiden) Success Story

Aim: to address ambitious research questions that can only be answered by the coordinated work of a small group of PIs

2012-2013: two pilot Synergy grant calls

- 1,5-3% success rate: only 24 projects selected
- 5 Dutch projects successful;
- 7 Dutch host institutes involved;
- Leiden researchers part of two different Synergy Grants!

Draft Work Programme 2018: a new SyG call!

- Indicative budget: **250 M€**
- To select **25-30 projects**
- Calls foreseen on a **yearly basis**

Synergy Grant 2018: Key aims

Enabling PIs to bring together complementary skills, knowledge, and resources in new ways, to jointly address ambitious research problems:

- to promote substantial advances at the **frontiers** of knowledge
- to **cross-fertilize** scientific fields
- to encourage **new** productive lines of enquiry and new methods and techniques at the **interface** between established disciplines
- Research not only at the forefront of European science but also **a benchmark on a global scale**
- Research that could lead to **breakthroughs not possible** by the individual PIs **working alone**

Synergy Grant 2018: Key features

- **2** or **3** or **4 PIs**
- **No location** constraints:
  - PIs can come from the same corridor in one HI, different HIs within one country, or from different countries (within EU or AC)
- Budget of up to **10 M€ per project**
  - additional 4 M€ more in case of PI moving to EU, purchase of major equipment and/or access to large facilities
- **≥30%** of working time on the ERC project

- Indicative call opening: 19 July 2017
- Indicative call closure: **14 November 2017**
- Proposals to be evaluated between November 2017 and September 2018.

Bezint eer ge begint.. (look before you leap!)

ERC foresees SyG to be a highly competitive call

- only exceptional proposals are likely to be funded that show ambition and joint effort

'Synergy' is not simply a successful collaboration

- The interaction needs to yield more than just the sum of the individual parts

Tough future restrictions on submissions planned

- Think twice before applying: PIs evaluated with a **C score in 2018** will **not** be able to apply to **any** ERC call in 2019!

Thank you!

National Contact Point for ERC:
Esther Verhoeven and Doenja Koppejan

www.rvo.nl/horizon2020

horizon.erc@rvo.nl

088-6024210

European Research Council

Consolidator Grant – Stage 2
Research proposal

EMBEDDING CONQUEST

Petra Sijpesteijn

10 November 2015

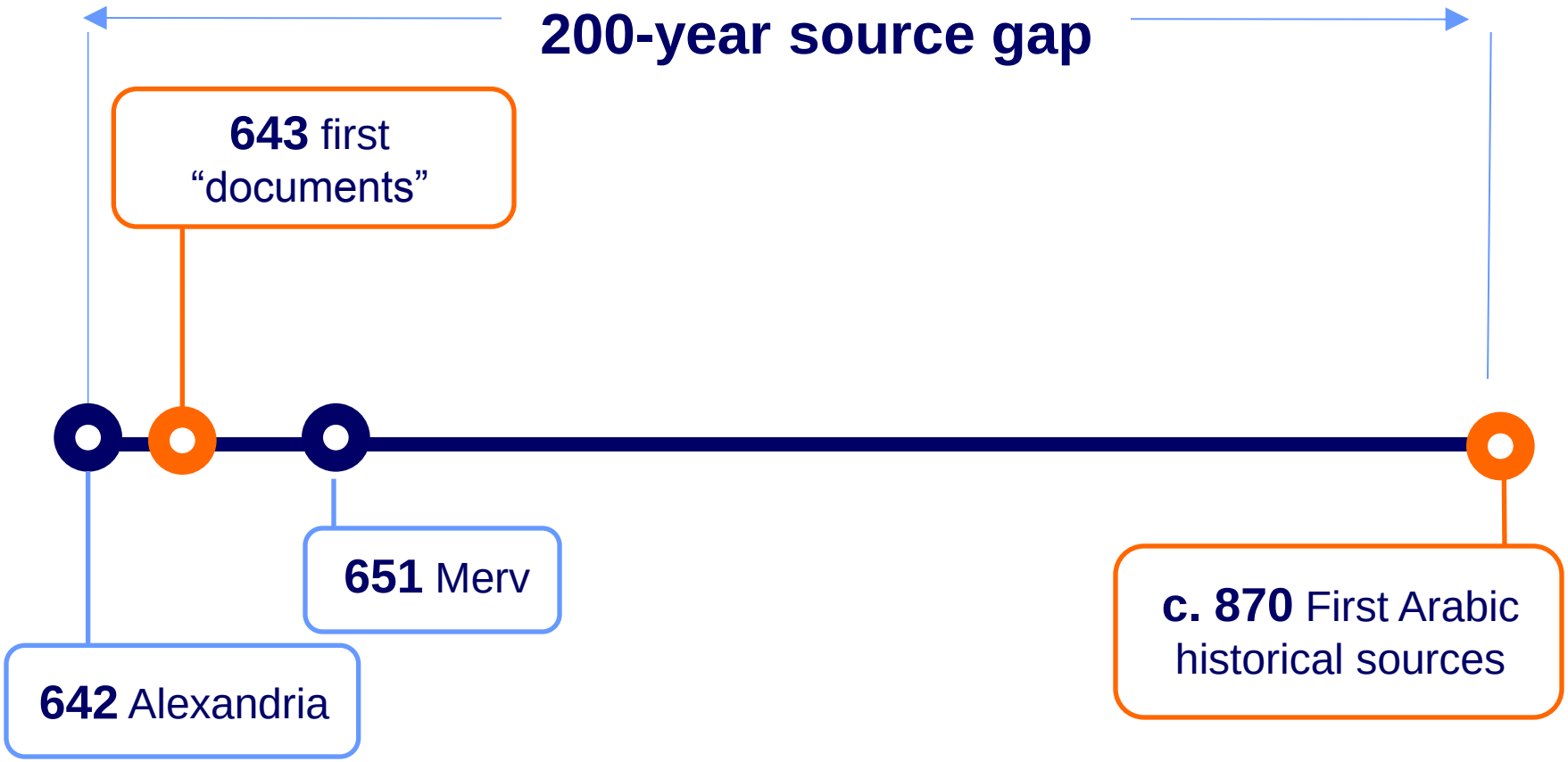
The aim

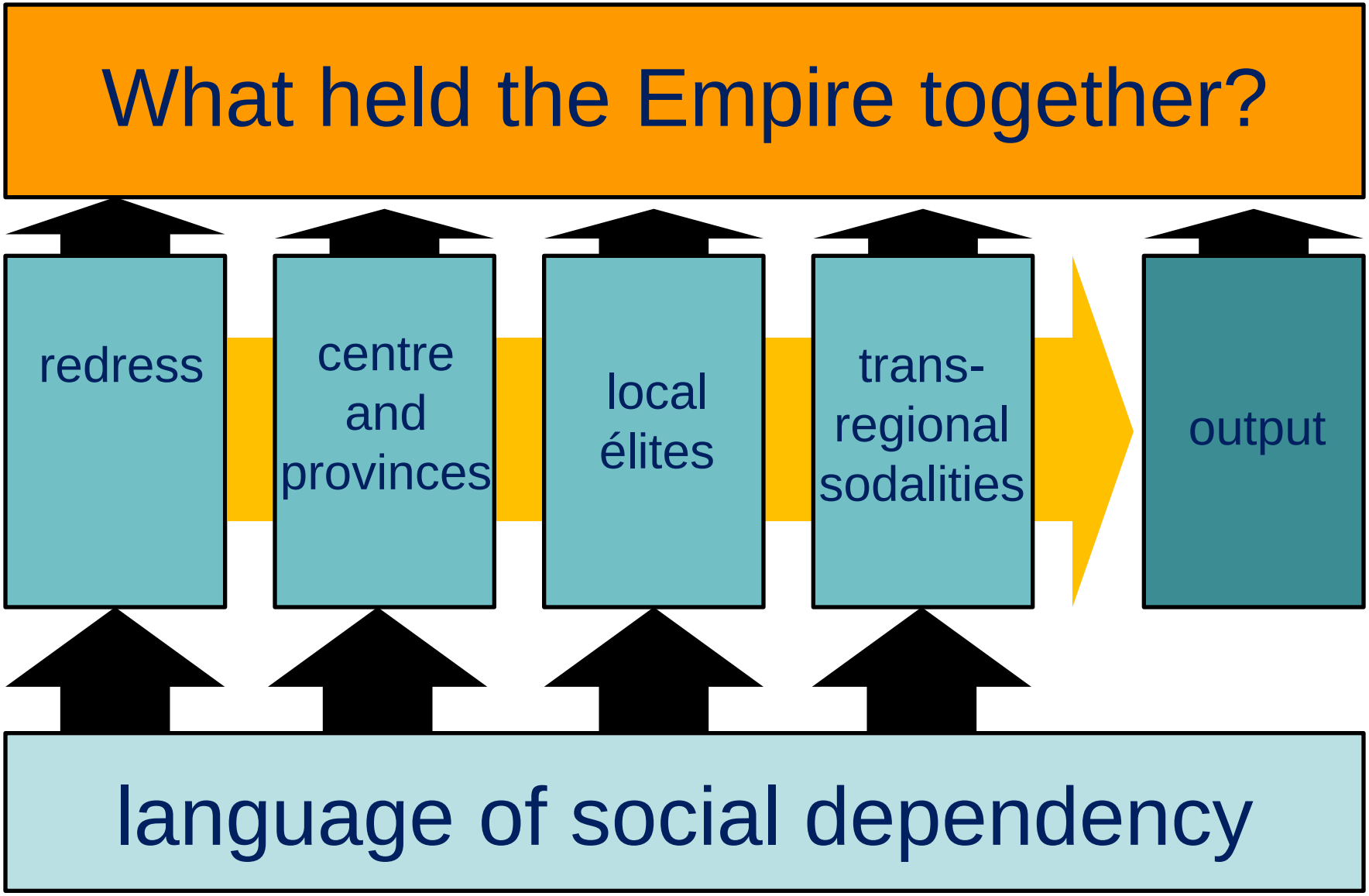
Understanding the success of the Muslim Empire: The potential of grass-roots perspectives

The puzzle

- Geographical scope
- Duration
- Continuing impact (religion, social fabric)

The answer: crucial new sources



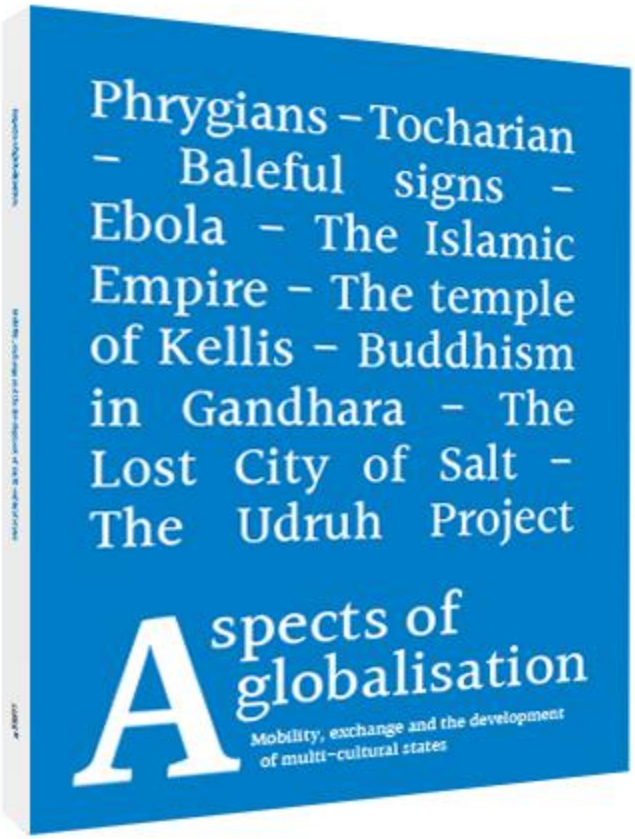

What held the Empire together?
redress
centre and provinces
local élites
trans-regional sodalities
output
language of social dependency

Results

1. Insight in Muslim formula for social cohesion
2. Add a unique documents-based, bottom-up perspective to empire studies
3. Sustainable disciplinary and linguistically integrated research environment

Impact

- Empire Studies at Leiden
- Push boundaries of research expertise
- Develop as project manager
- Digital Humanities



Thank you

HOW TO GET AN ADV GRANT?

Beyond the first decade

- ERC aims to sponsor innovative research that would not be possible without their support.
  - This excludes more of the same research

- ERC sponsors excellent research.
  - Top CV is rather helpful

- Applications are peer reviewed.
  - 7-10 extensive reviews. Balancing act between ambition and reality
  - Should be very well written (with nice figures)

- Define an interesting and exciting topic that is not too far from your main line of research.

Consideration of a topic

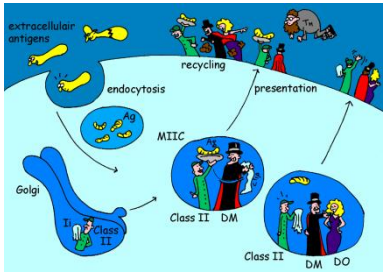
The Neefix laboratories

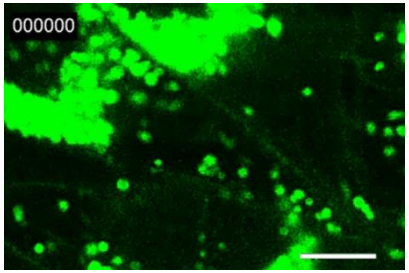
MHC class I and II

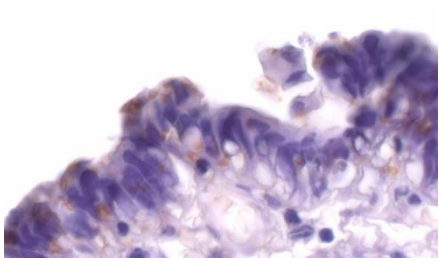
Endosomal transport

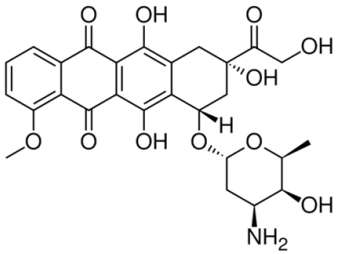
Bacterial induction cancer

Old cancer drugs

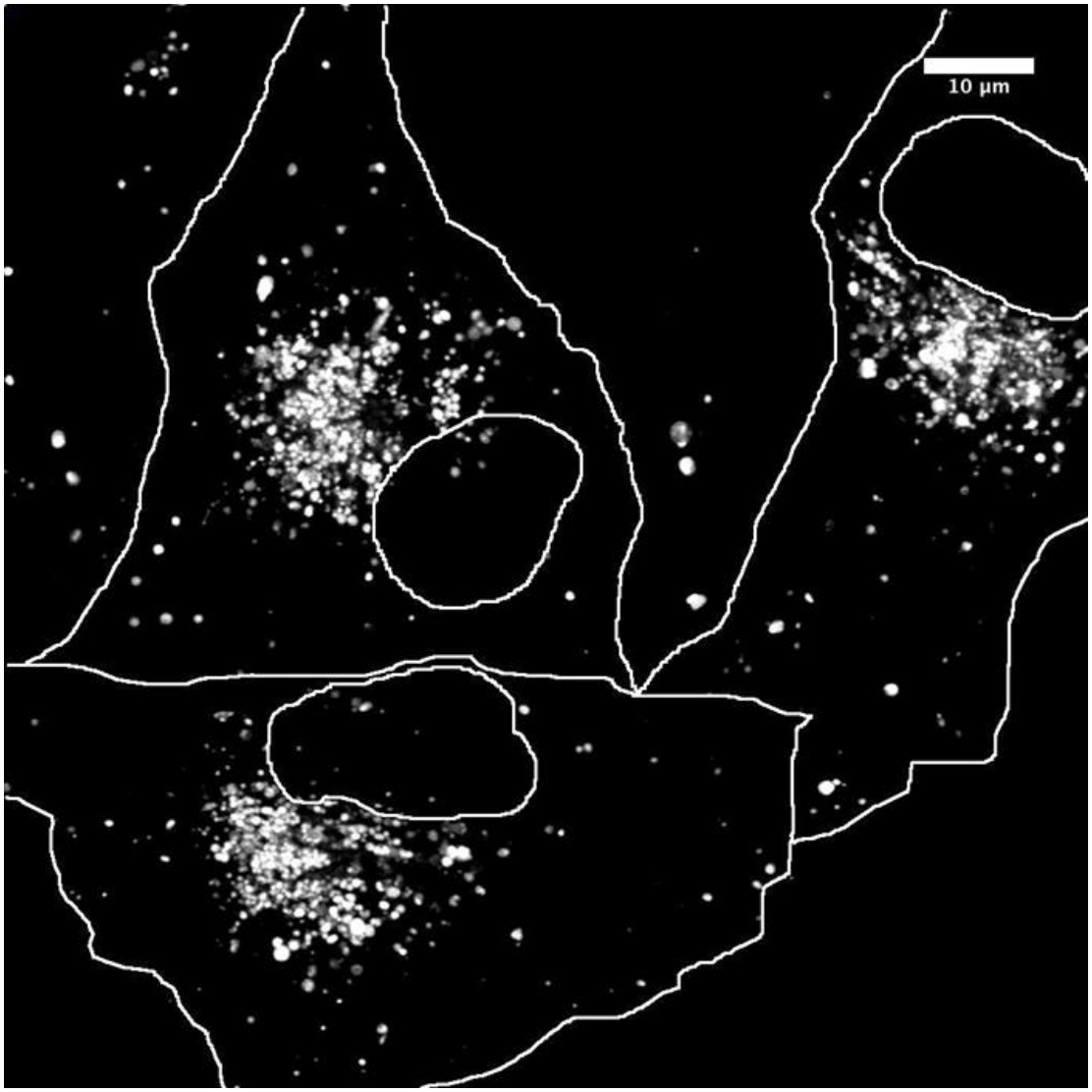






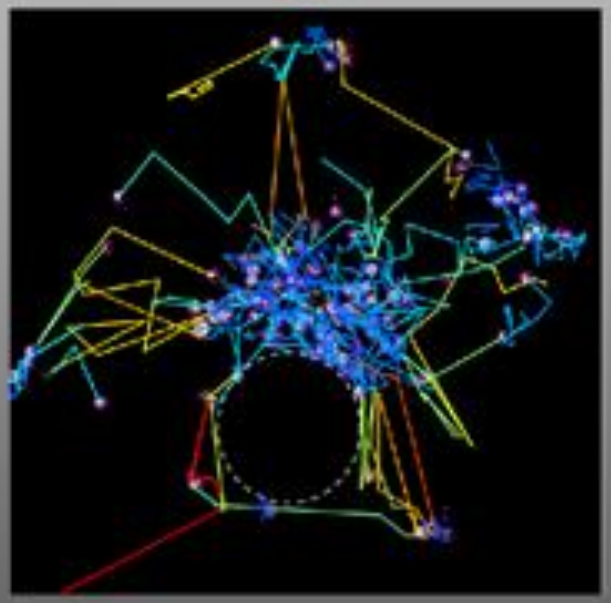


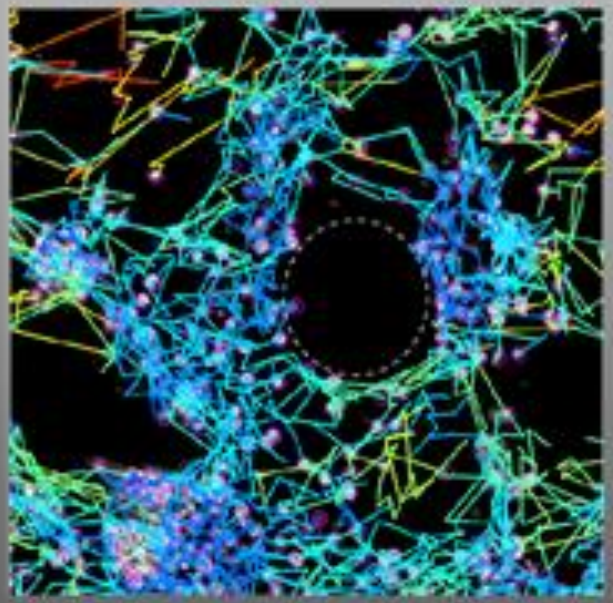
Define a cool question



Define a cool question

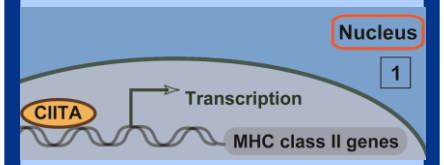
Why is organization like this and … not like this?



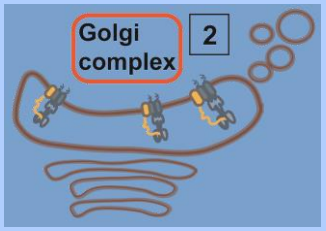


Unique data set: the MHC class II pathway

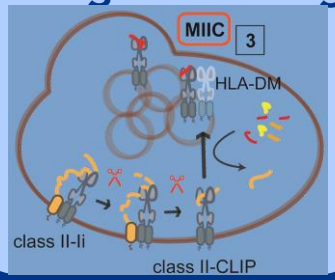
Transcription



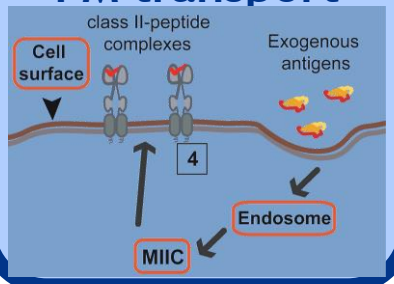
Golgi sorting



Antigen loading

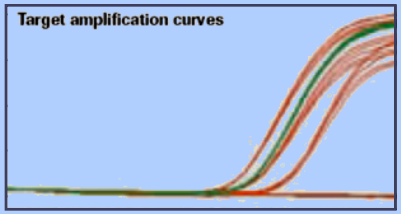


PM transport



Gene Expression Quantification

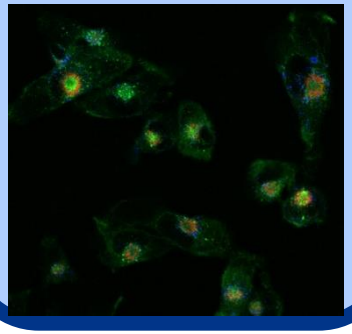
CIITA, MHC class II, Invariant chain, MHC class I



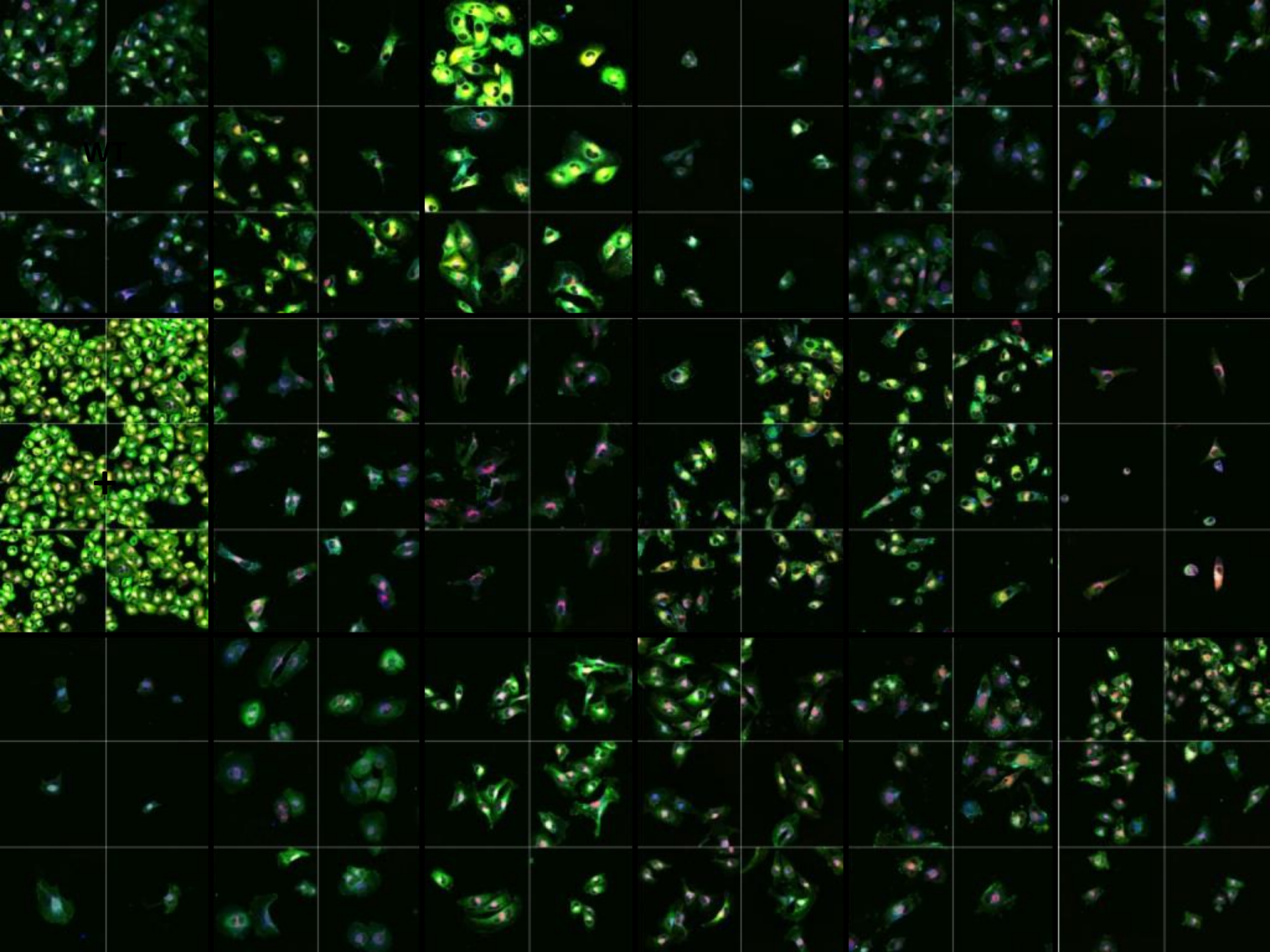
by q RT-PCR

Light Microscopy

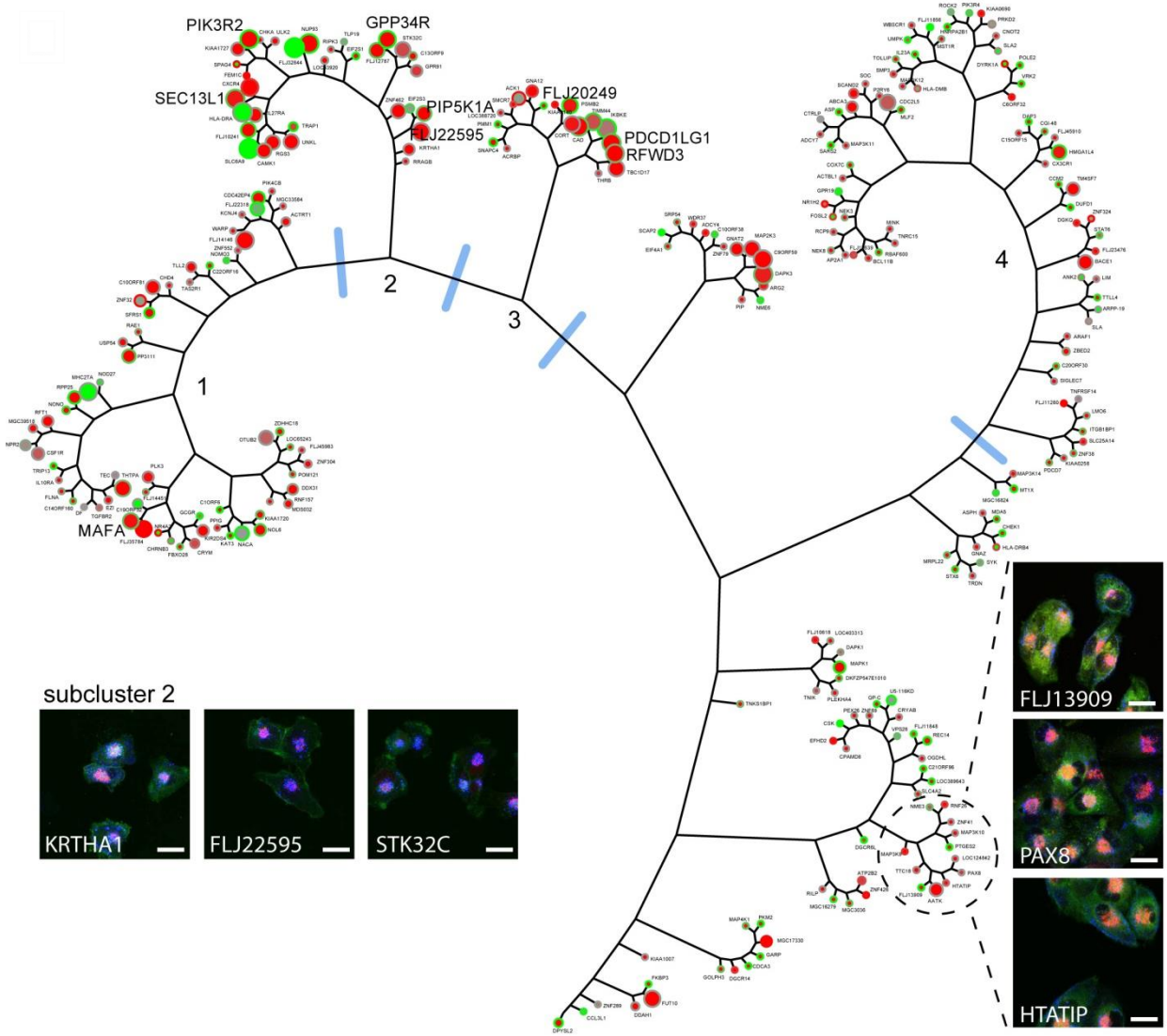
MelJuSo/HLA-DR GFP
Golgi RFP
EEA1 Alexa647



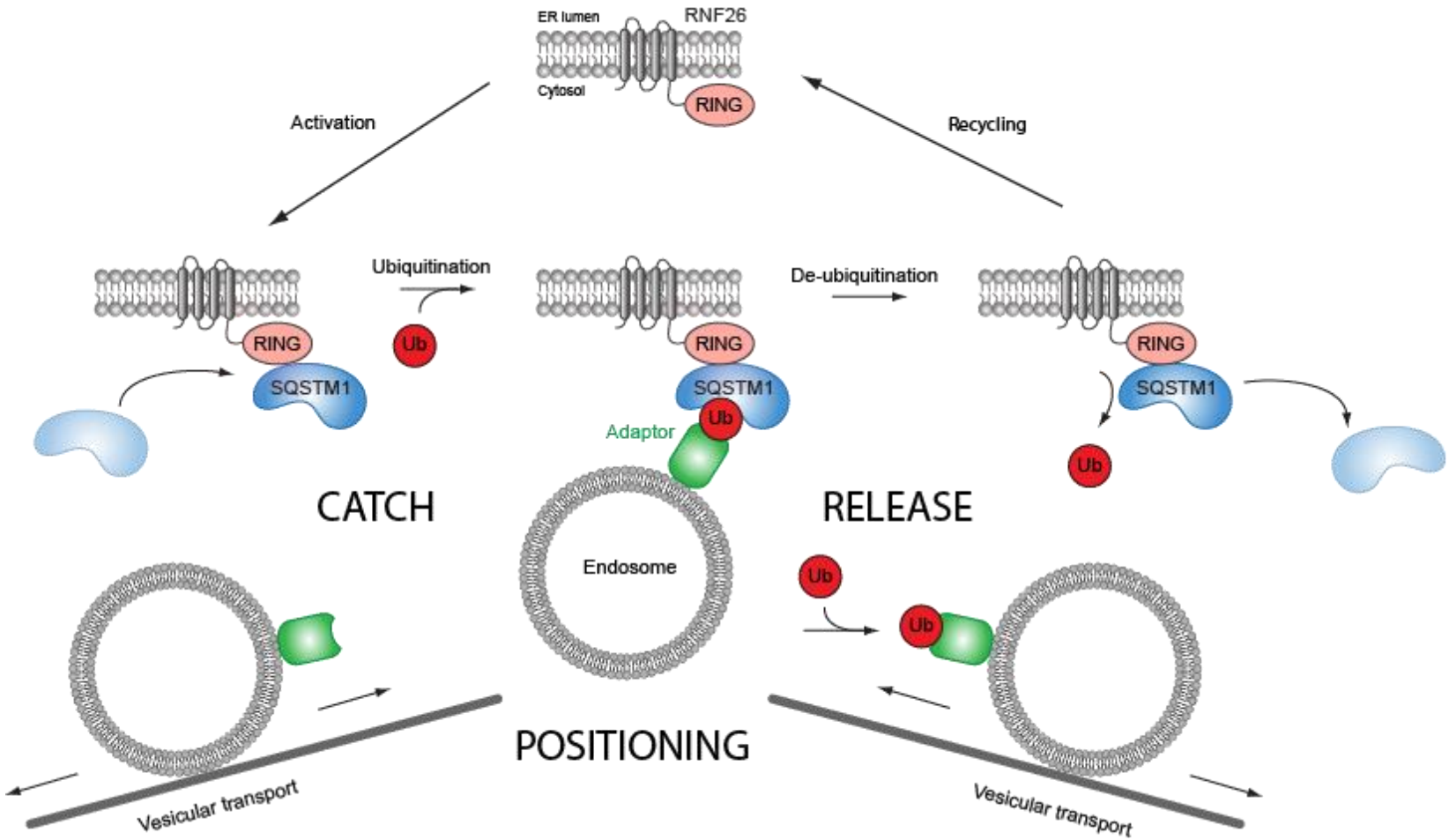
Changes in Cell surface CerCLIP levels


WT
+

Have unique data integration set



Have breakthrough aims



Remaining points

- ERC in principle supports fundamental curiosity driven science. Application is possible and they have a special program for this (PoC). I have support for a purely fundamental program .
- ERC is important for career development. Considered to be a measure of esteem with high quality selection.

Should you also apply?