

ECDHM 2025



Non-Violent Bloodshed

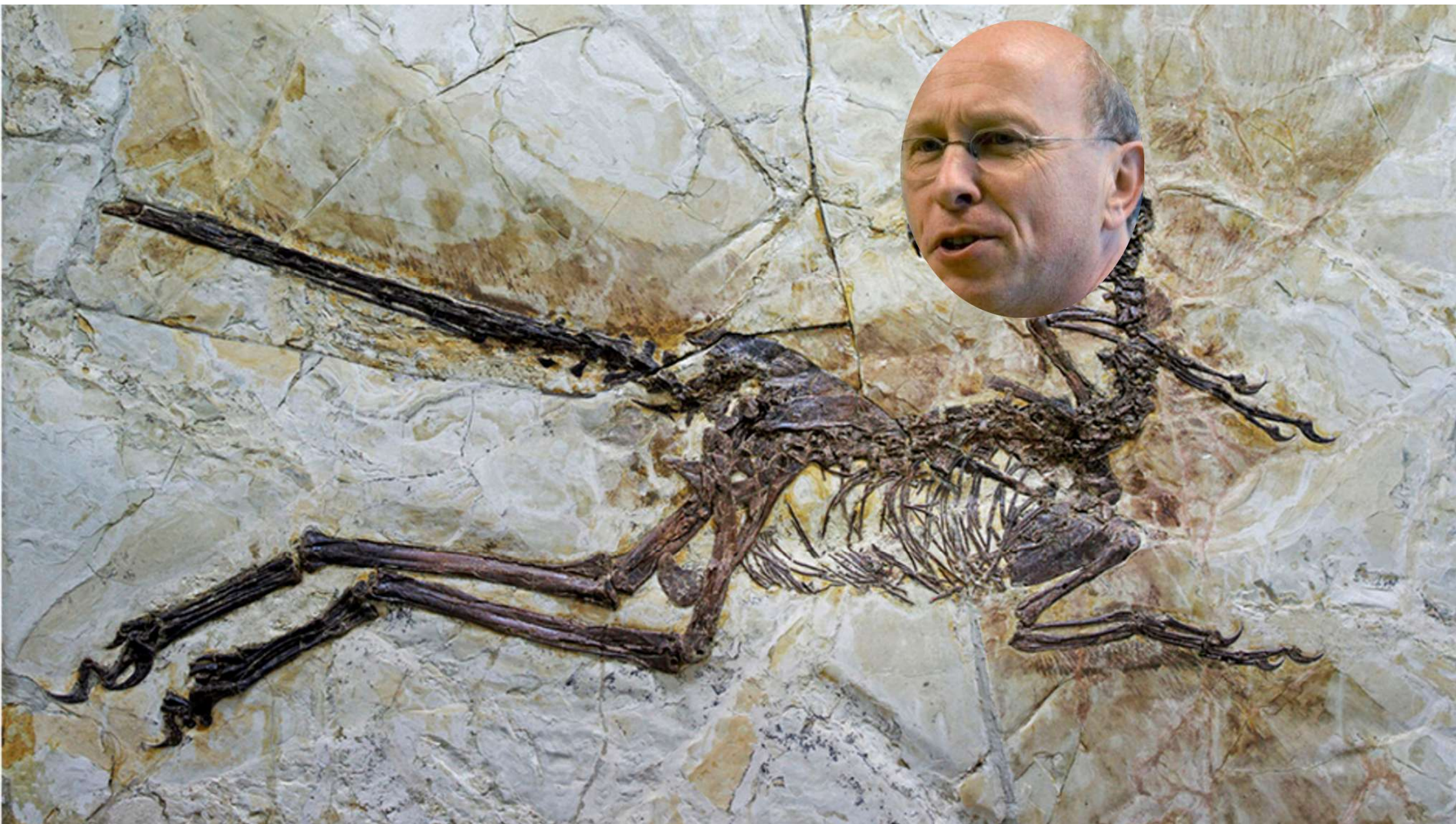
Historical Notes and a Glimpse into the Future

Wijk aan Zee NL

10 September 2025

Wim de Kort

eba



Today's Menu

- **Bloodletting**
- **Blood Transfusion**
- **Blood Banking**
- **Blood Donor: Supplier or Client?**
Behavioural Science
- **Blood Donation Safety?**
Donor Health Care
- **The Future of Blood Donation**
Artificial Blood



Today's Menu

- Bloodletting

Giving Blood for Your own Good (only)



Tractatus de Pestilencia; Albik, M, (15th century)



A Set of Bloodletting Tools

Advanced Logic

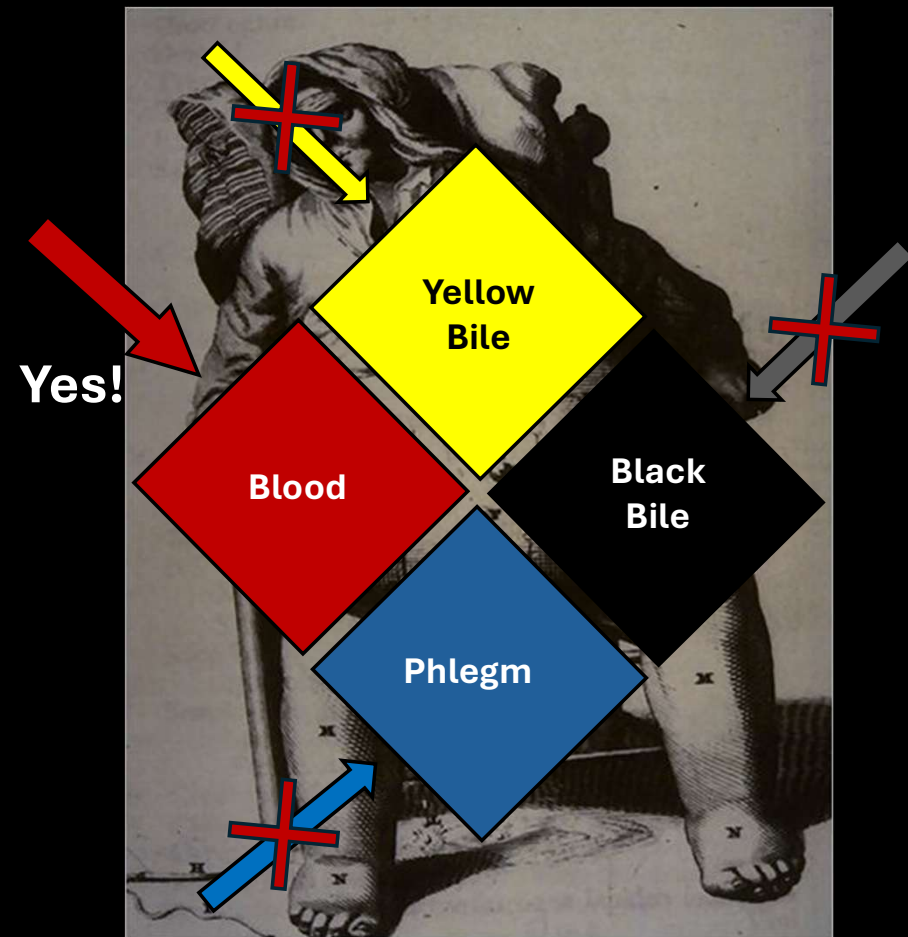
**Bro, did you eat
from my plate?**

No



5th – 4th Century BC
Hippocrates

Bloodletting



Engraving by Frederik Dekkers (1694)

5th Century BC – 19th Century

Bloodletting

A crazy treatment applied for some 2,500 years



Painting by Egbert van Heemskerck (1635-1708)

17th –18th Century

Bloodletting

Two well known victims



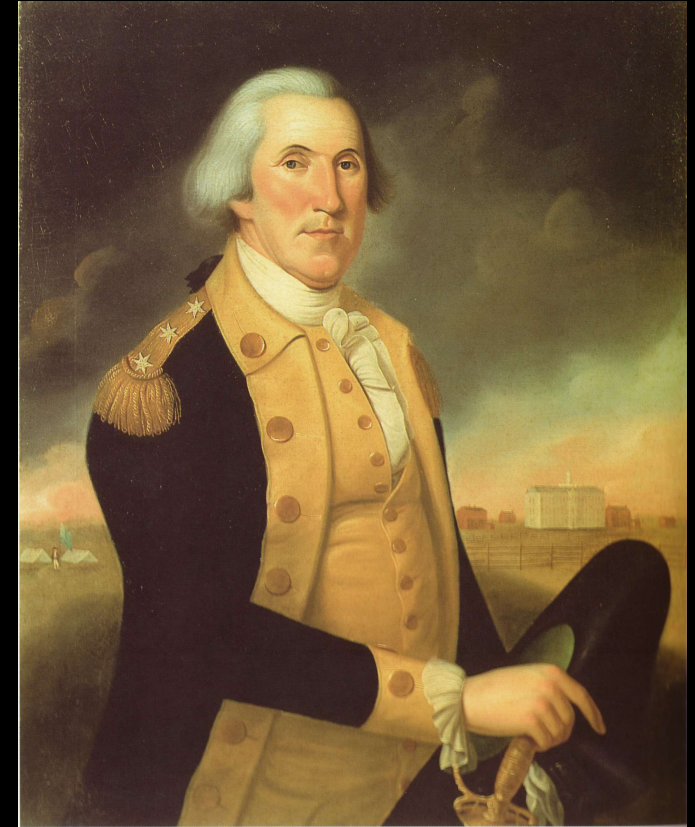
Painting by Thomas Hawker (1641-)



Charles II, England
† 1685

George Washington,
VS

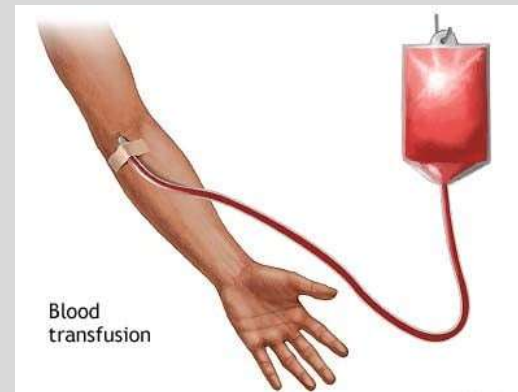
† 1799
→



Painting by Charles Peale Polk (1767-1822)

Today's Menu

- Bloodletting
- Blood Transfusion



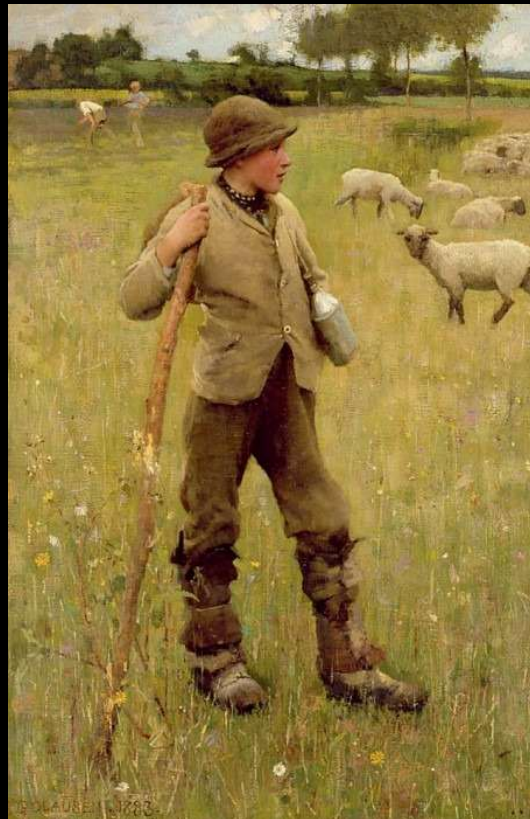
21st Century

Pope Donald I

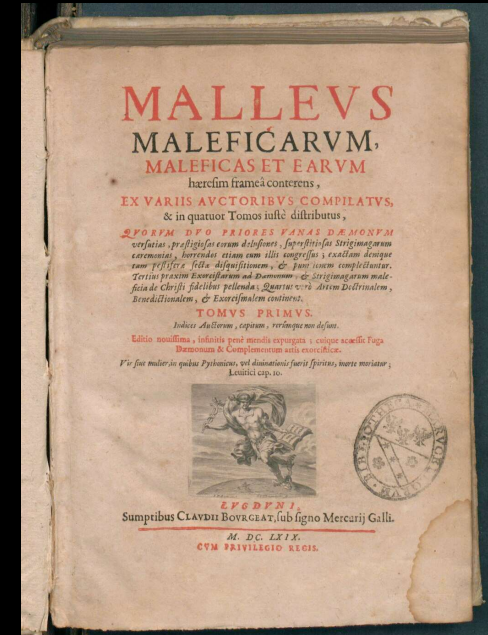


Innocent VIII (Jean Baptiste Cibo) Genoës, Pape en 1484.

† 1492.



Painting by Sir George Clausen (1883)



Portraitstich-Slg. des Bürgerkönigs Louis-Philippe (18th Century)

19th Century



James Blundell, England
First documented Direct
Human-to-Human Transfusion
The Lancet 1828

19th Century

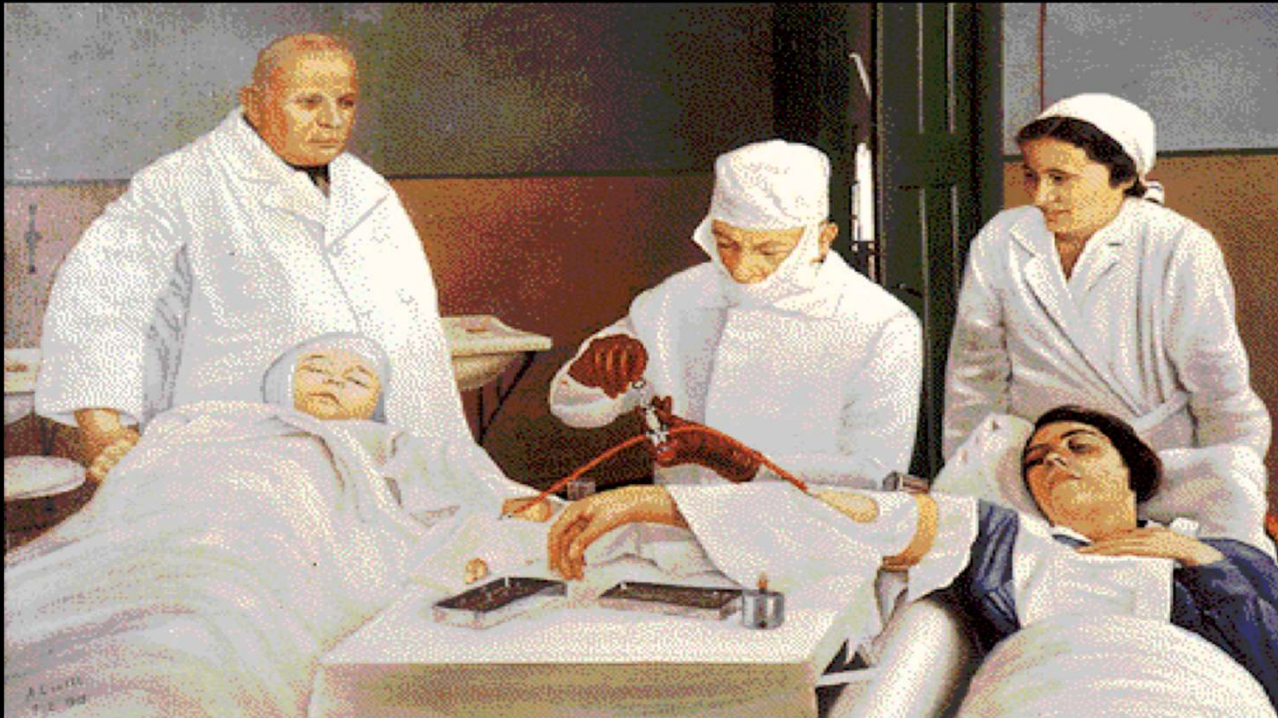


**US Civil War
Blood
Transfusion
Blundell's Way
1865**

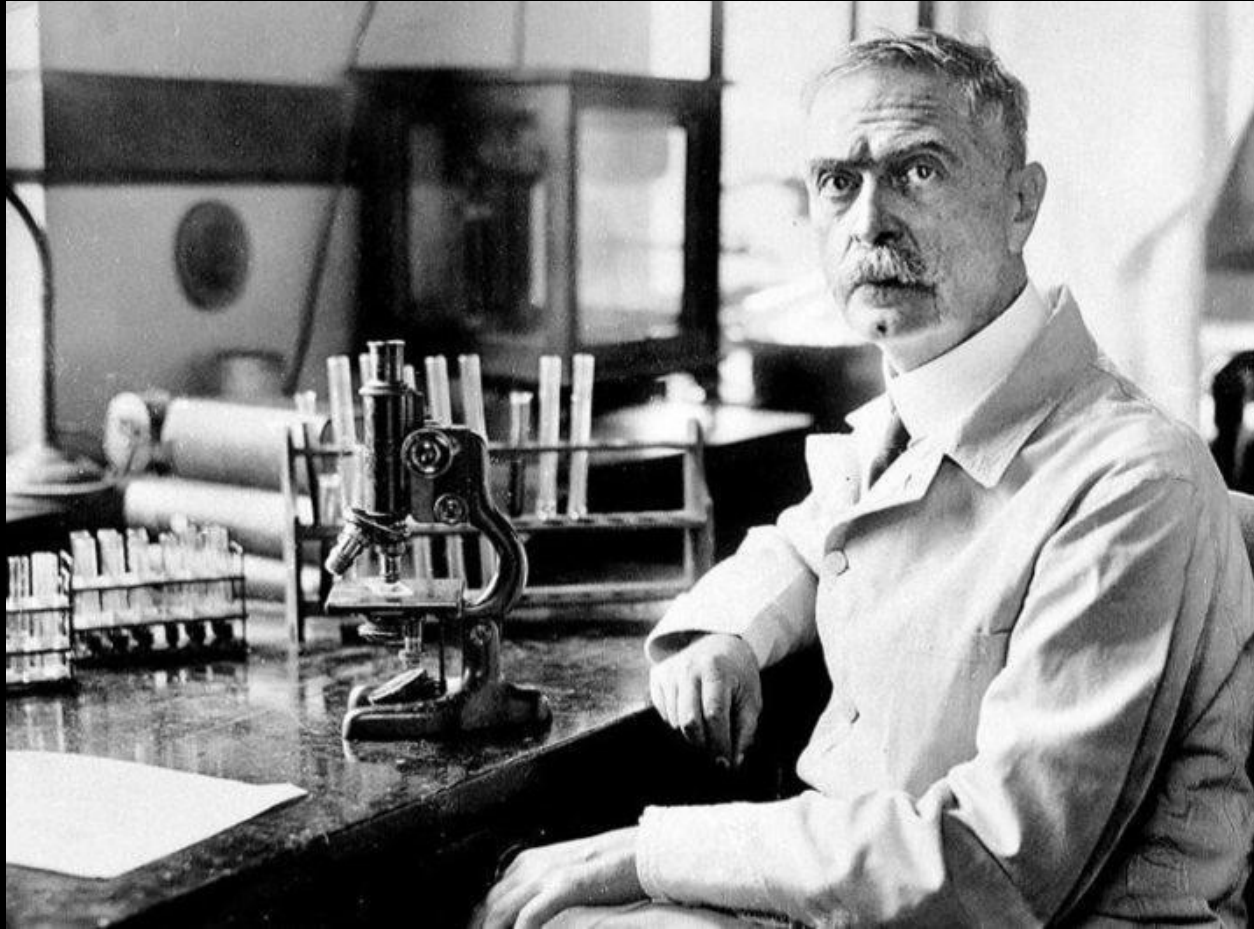
Frame from PBS Mercy Street Series, 2017

20th Century

Direct Human-to-Human Transfusion First half 20th Century



20th Century



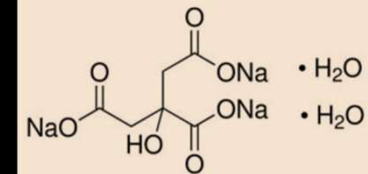
Karl Landsteiner, Austria
Discovery of:

- **ABO Blood Group, 1901**
- **Rhesus Factor, 1937**

World War 1

Albert Hustin, Belgium

First documented Indirect
Human-to-Human Transfusion
March 1914



Sodium Citrate

R. Van Hee, 2015

World War 1



L. Bruce Robertson, Canada
First Indirect Blood Transfusion
during the Battle of Cambrai, 1917

Today's Menu

- Bloodletting
- Blood Transfusion
- Blood Banking



A blood bank is a centre where blood –gathered through blood donations– can be processed, stored and preserved for later use

World War 1

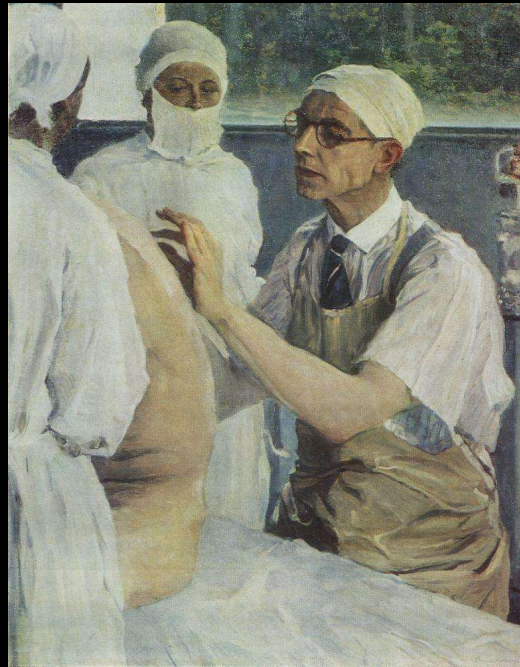


Oswald Hope Robertson, USA
First Blood Bank
WW1 – Western Front, 1918



Interbellum

Blood from deceased, Russia 1930's



Sergei S. Yudin

Painting by Mikhail Nesterov (1933)

Today's Menu

- Bloodletting
- Blood Transfusion
- Blood Banking
- Blood Donor: Supplier or Client?
Behavioural Science

*What if we simply consider
the donor to be a supplier?*

*Well, it shifts safety priorities away
from the donor towards the recipient*

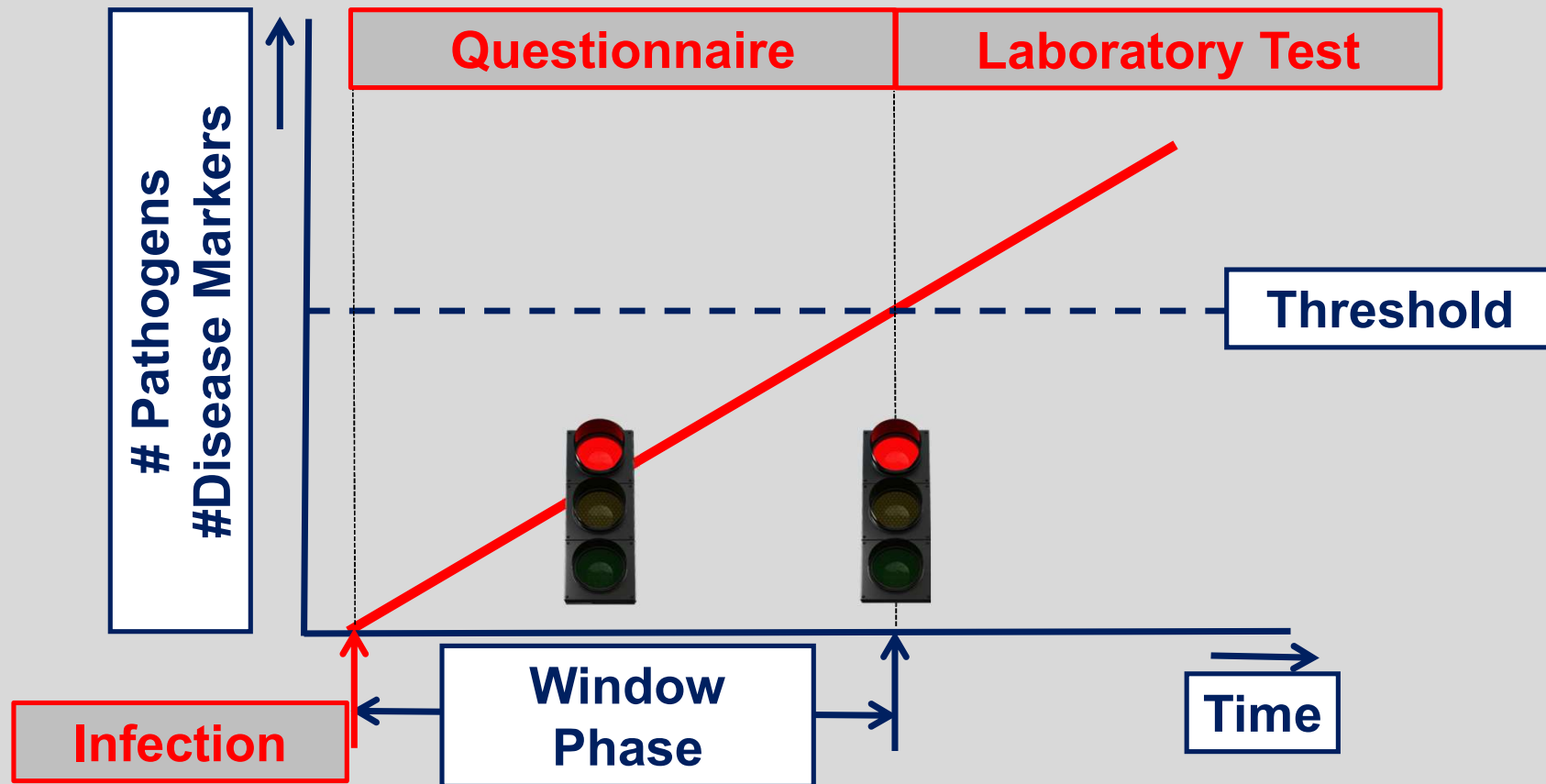
Protection of Recipients

Good Manufacturing Practice:

- **Optimizing Production Process**
- **Preventing Administrative Errors**
- **Avoiding Transmissible Infections**

Motto: Donors and their Blood are dangerous, unless proven otherwise

Detection of Pathogens in Donors





**Good Questioning is an Art
(As Pope Innocentius VIII already knew)**

**Source: Les Merveilles de la Science
French School, published ± 1870**

MONITORING HEALTH (RISKS)?

1. Monitoring health (risks) should include corrective follow-up actions *for the persons monitored*
2. So, we do not monitor Donor Health Risks, but identify Conditions in the Donor bearing Risks to Blood Banks or Recipients

Examples:

- Low Hb Levels in Donors get no Follow Up
- Donors carrying a Transmissible Infection Risk are NOT tested!



Change Ahead!



WANTED: DONOR STUDIES



Painting by Rembrandt van Rijn

Countries with continuous Activities on Donor Studies

- Australia
- Austria
- Belgium
- Canada –
- Denmark
- Estonia
- Finland
- France
- Germany



dom

s

less frequent

2004: start of Donor Studies Dept

Aim: Studies on Donor Behaviour and Donor Health

First Paper on Donor Behaviour

Lemmens K, et al. Why don't young people volunteer to give blood. Transfusion. 2005 Jun;45(6):945-55

First Paper on Health Conditions in Donors

Hoekstra T, et al. Seasonal influences on hemoglobin levels and deferral rates in whole-blood and plasma donors. Transfusion. 2007 May;47(5):895-900

Today's Menu

- Bloodletting
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- Blood Donor: Supplier or Client?
Behavioural Science

What if we consider the Donor to be a Client instead of 'simply' being a Supplier?

The DOMAINE project (2008-2011) provided an answer



Donor Management in Europe

**An EU co-funded project on evaluating and improving
Blood Donor Management, strongly supported by the
European Blood Alliance, EBA**

Start: 2008

End: 2011



DOMAINE partners



www.domaine-europe.eu

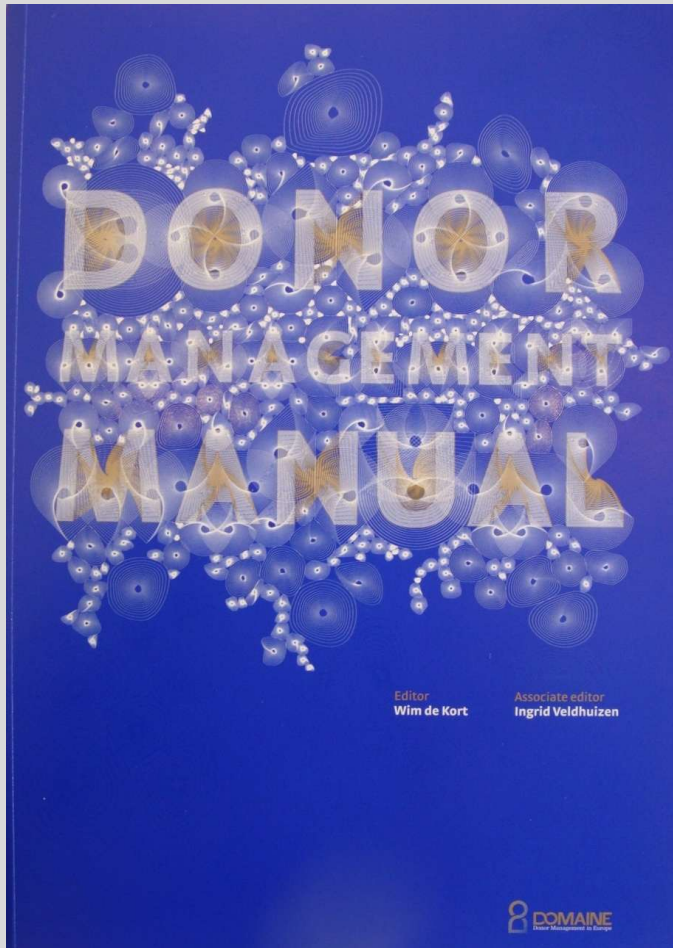
Good Donor Management





Results

1



2

Donor Management Training Five Modules:

1. Introduction
2. Donor Base Management
3. Donor Marketing
4. Collection Operations Management
5. Donor Safety

Domaine Trainings in:

- Lisbon (2011)
- Dublin (2013)
- Amsterdam (2014)
- Amman (2016)
- Islamabad (2017)
- Cairo (2018)
- Belgrade (2018)
- Tbilisi (2022)
- Vilnius (2023)
- Riga (2024)
- Training Modules (2014-2020)
in many more places, e.g. Austria,
Canada, China, Estonia, Germany,
Italy, Ukraine, USA

Donor Management Training Five Modules:

1. Introduction
2. Donor Base Management
3. Donor Marketing
4. Collection Operations Management
5. Donor Safety



3-5 September 2014
The Hague - The Netherlands
conference@sanquin.nl



1st European Conference
on Donor Health
& Management

 Donor Base Management

 Donor Recruitment

 Donor Retention

 Donor Collection

 Donor Health



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Health Care



Iron and Humans

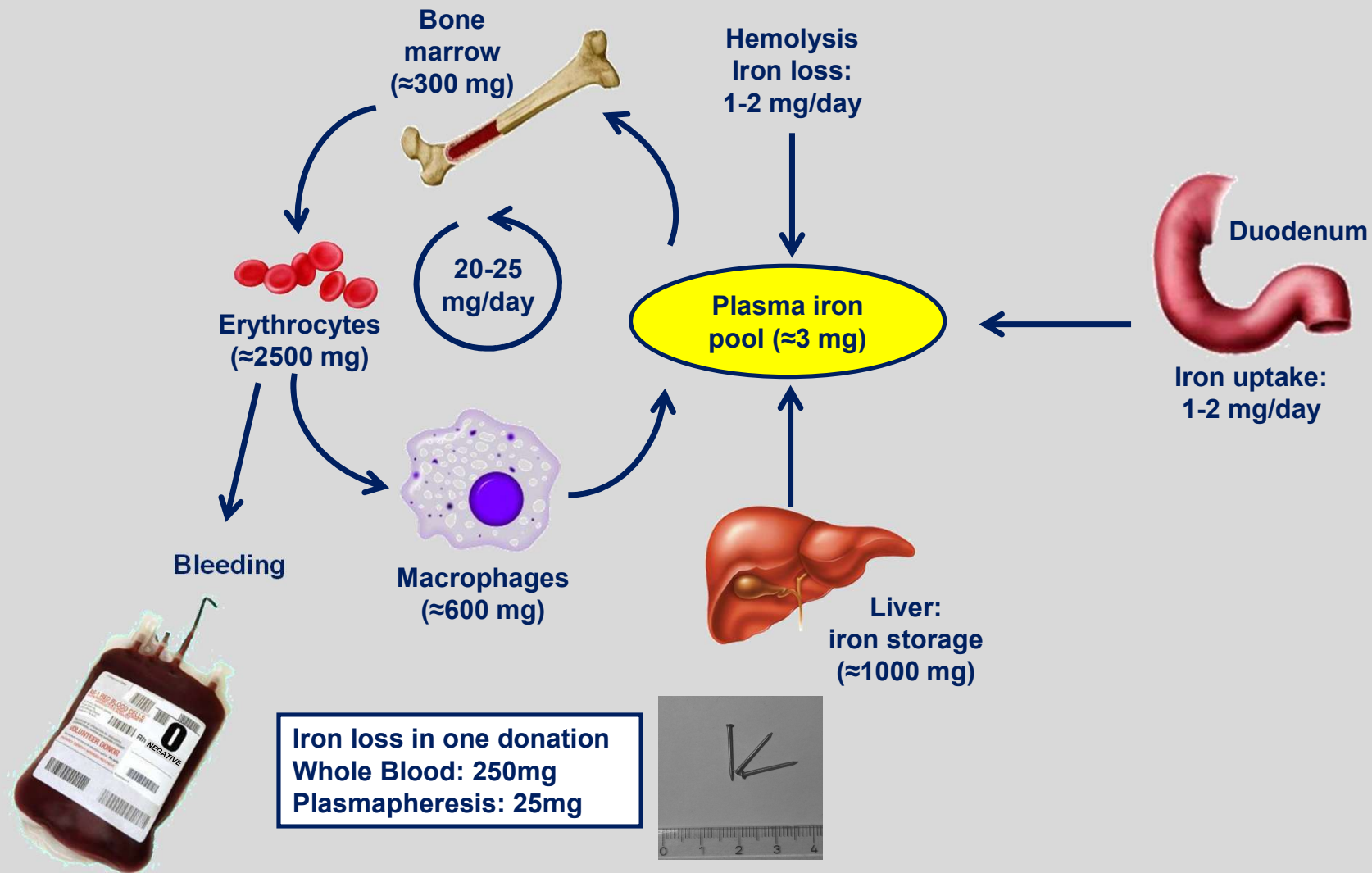


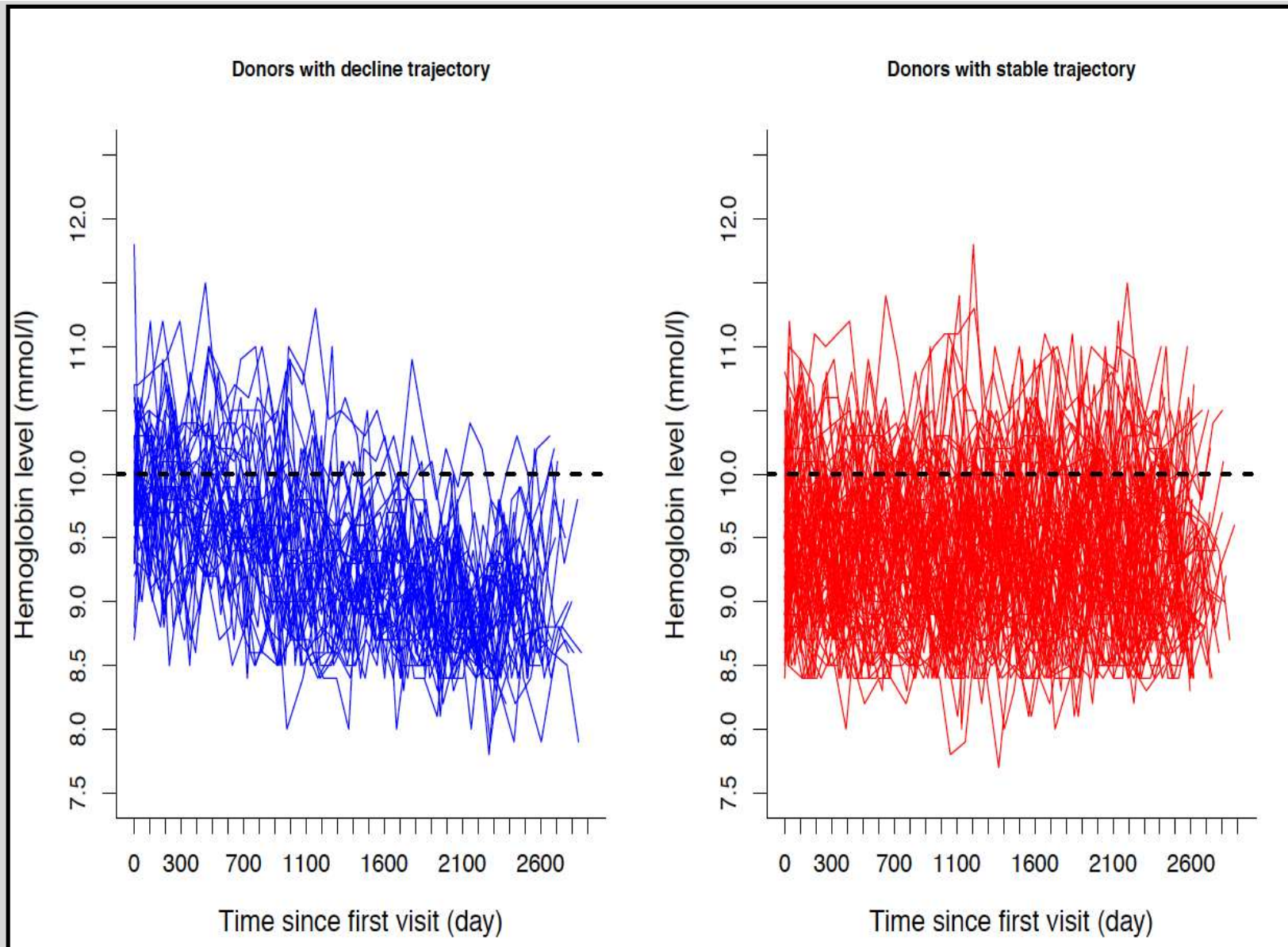
30% Fe



0.003% Fe

A Love and Hate relationship



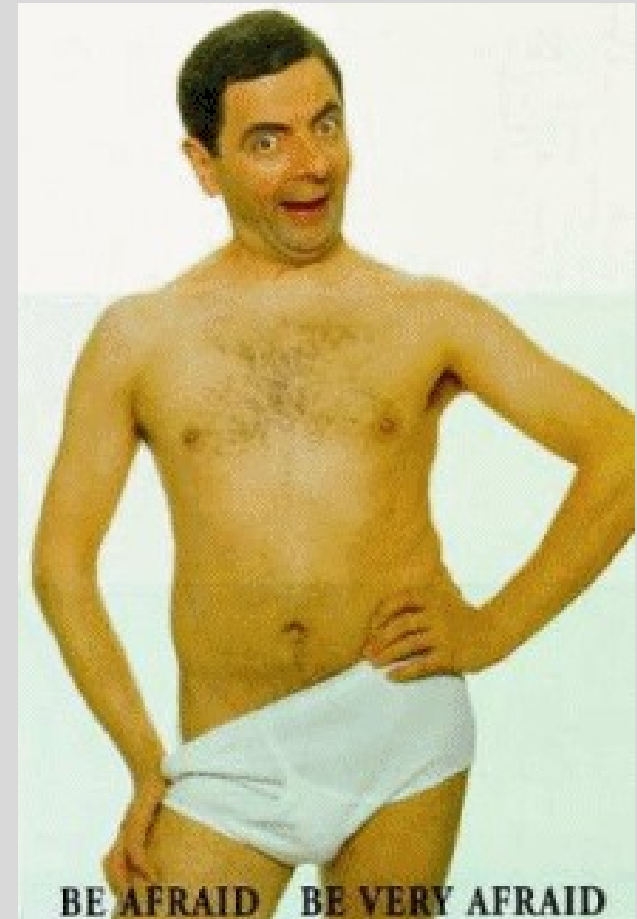


New Motto:
‘Donor Lives Matter’

- **Understand Donor Behaviour**
- **Promote Donor Wellbeing**
- **Improve Donor Base Management**
- **Prevent Adverse Effects of Blood Donations on Donors**

Today's Menu

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Behavioural Science
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Health Care
- **Blood Donation Future**
Artificial Blood



What if we introduce Donor Conscription?

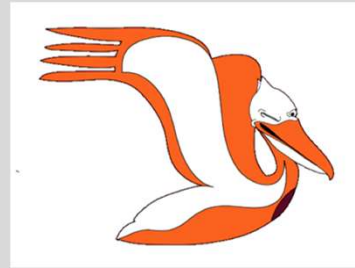
$$18,000,000 * \frac{1}{2} * 0.075 * \frac{1}{4} \cong 168,750 * 2,2 = 371,250$$

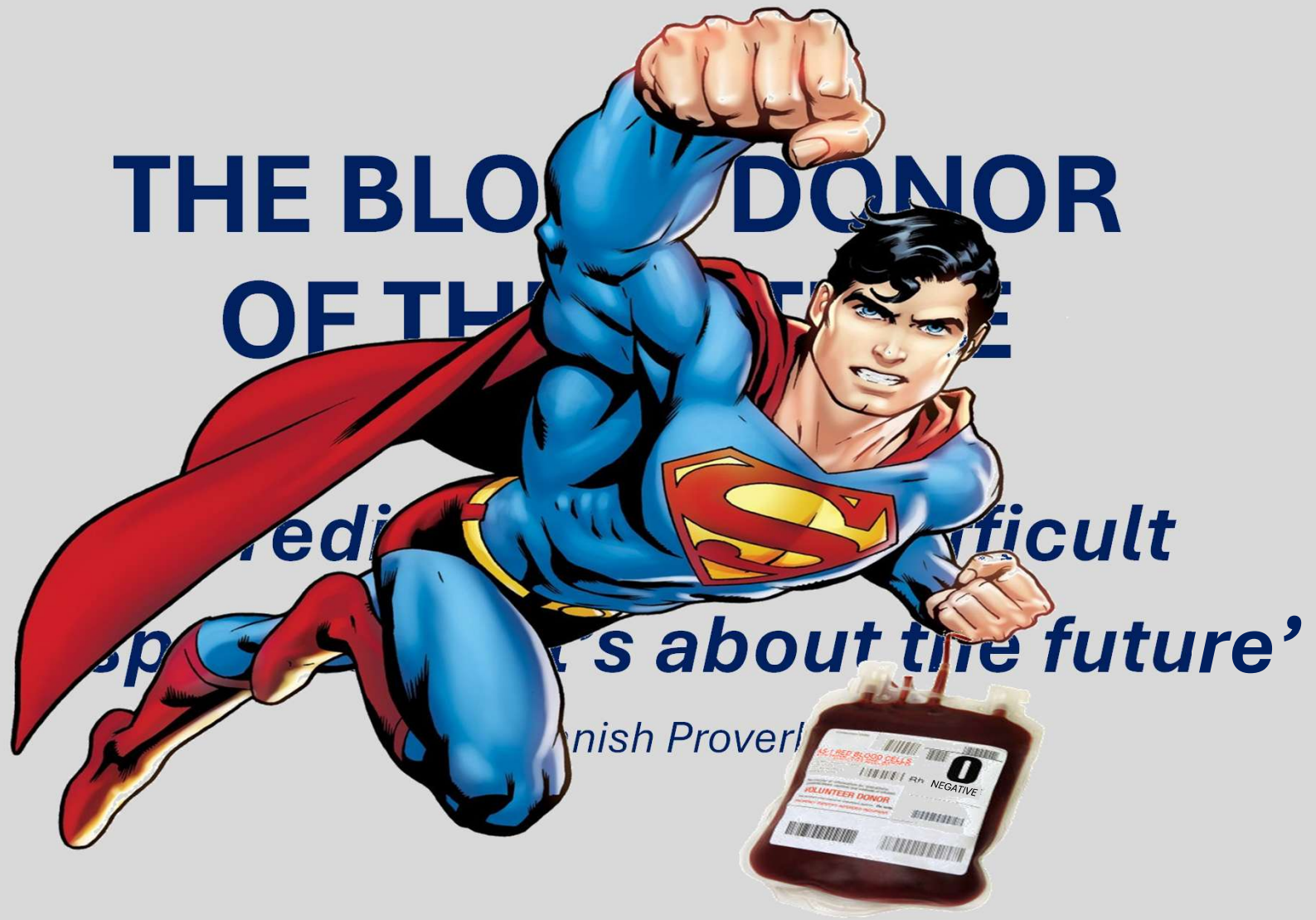


Male

Eligible?

Onegative





THE BLOOD DONOR
OF THE FUTURE

Medi... difficult

sp... s about the future'

ish Proverl

Donor Interview



Wait, Superman! Where have you been?!?!

What if future Transfusion Units are produced in a Bioreactor ?

Advantages

- 1. Avoids**
 - Allo-Immunization
 - Bloodborne Disease
- 2. Allows for Novel Therapeutic Applications**
- 3. Brings Less Donor Dependency**

Protocol: Epo/SCF/Dex for expansion, Epo and plasma for terminal differentiation

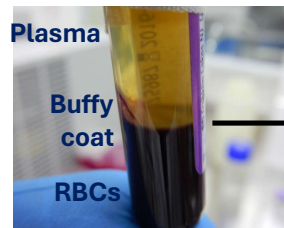
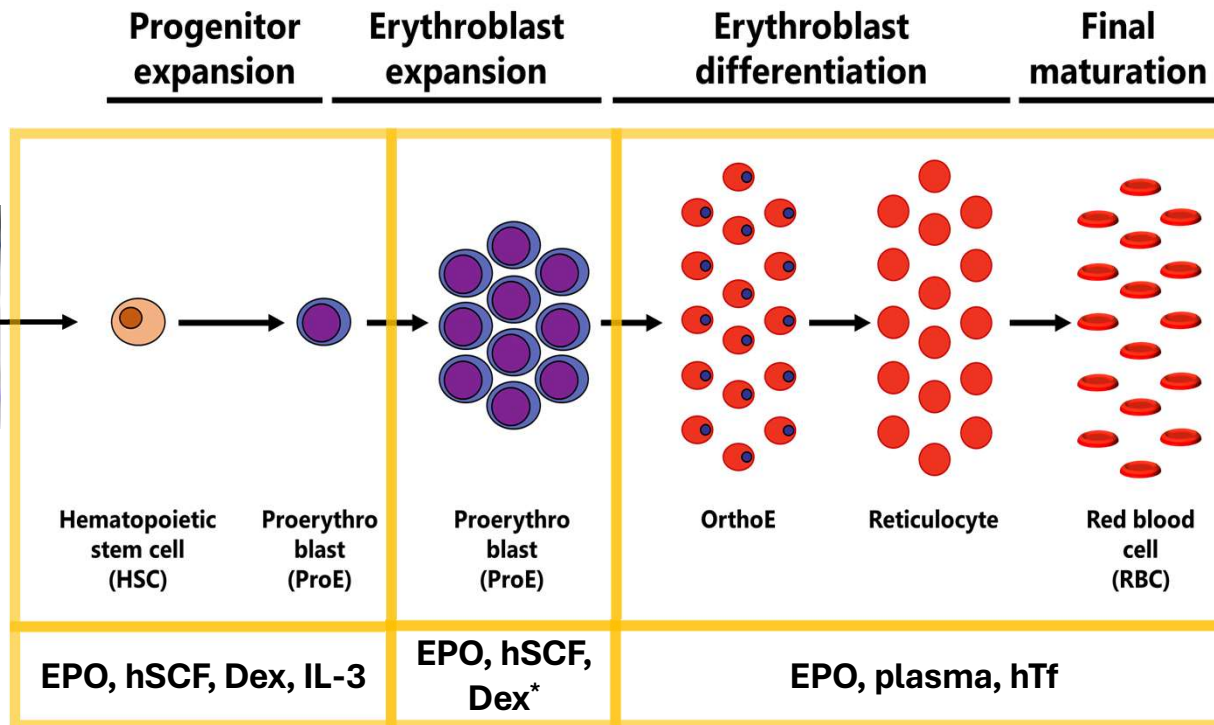


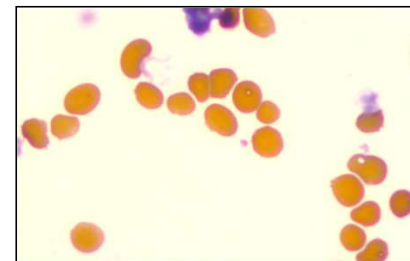
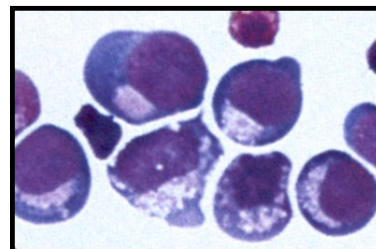
Photo by Barquera et al. / CC BY-NC-SA 2.0



2 x 10¹² RBCs



Photo by ICSident / CC BY-SA 3.0



Production of cRBC

From dishes to bioreactors



Courtesy of Emile van den Akker



15ml 'blood'



Blood Banking is about People

Donors



Blood Banking is about People

- Donors
- Blood Bankers
- Supporting Staff



Blood Banking is about People

- Donors
- Blood Bankers
- Supporting Staff
- Curious People, including Researchers



Donor Studies Dept Achievements so far

- Three Professorships



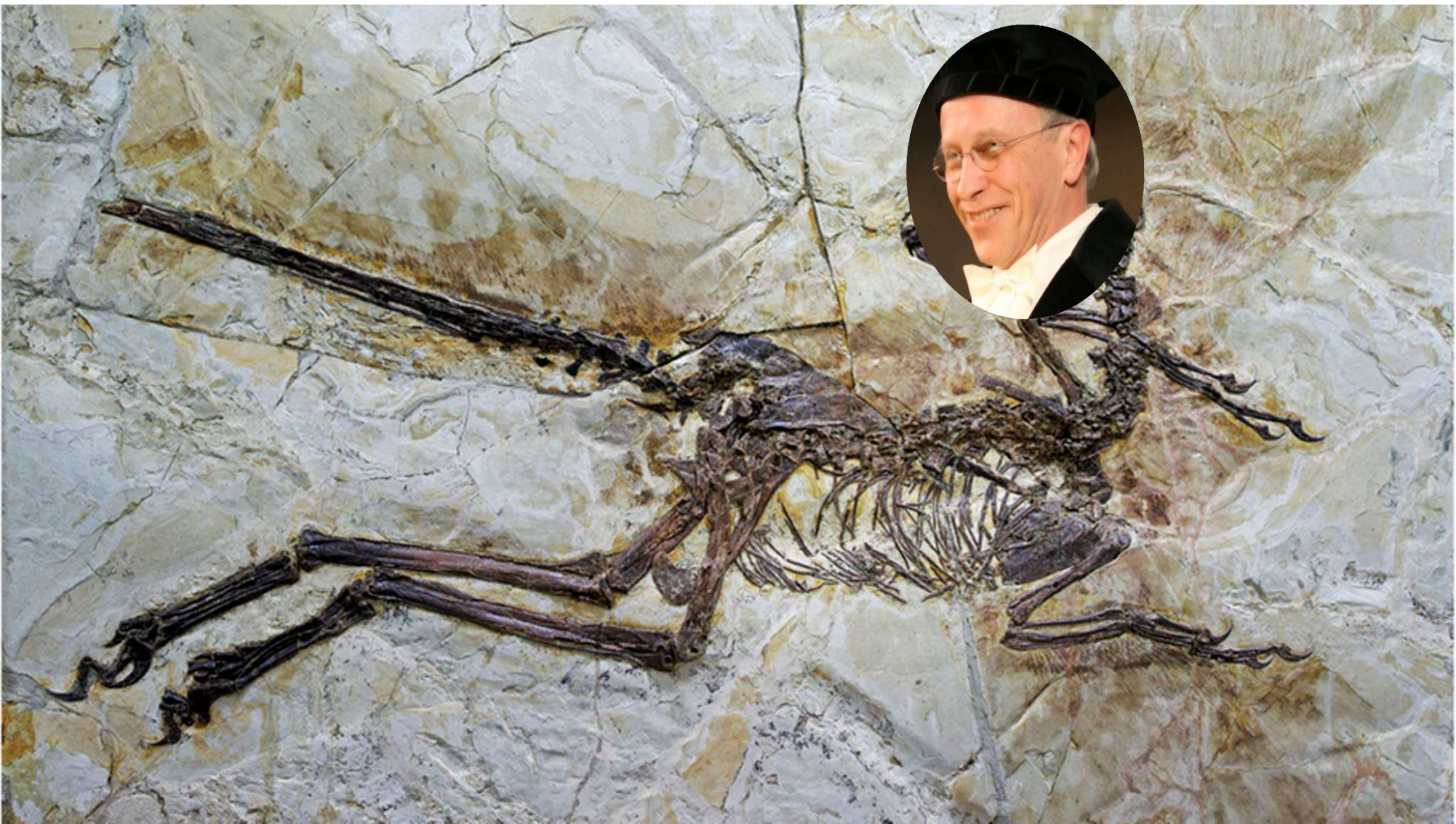
- Four EU-(co-)funded projects (Domaine; DoHeCa; Transpose; ERC)
- Numerous other Grants
- >300 Peer Reviewed Papers

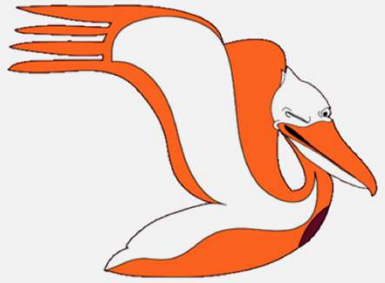
- Tons of Fun



What is Today's Message?

- **Donating Blood is a Good Idea**
- **Bloodletting was a Stupid Idea**
- **Many Challenges were overcome on the way to a Safe Blood Supply**
- **Blood Banking was not easy to realize**
- **Our Blood Donors are Clients and deserve to be treated accordingly**



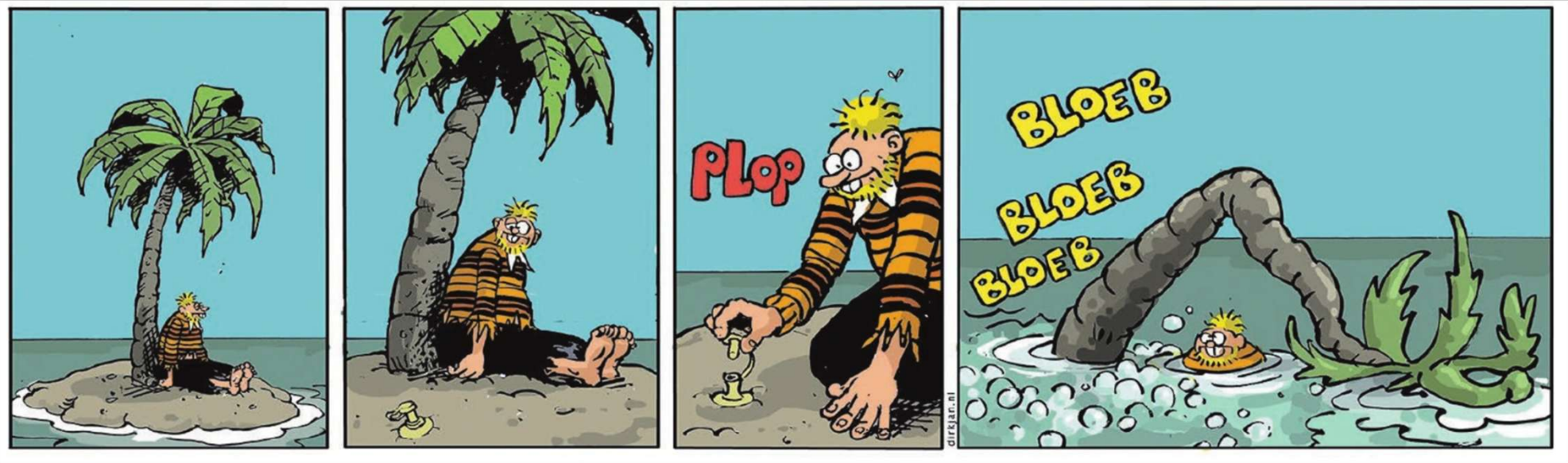


**Let's Go for the
Best ECDHM Ever**

eba



Take Care !!



Thank You !!