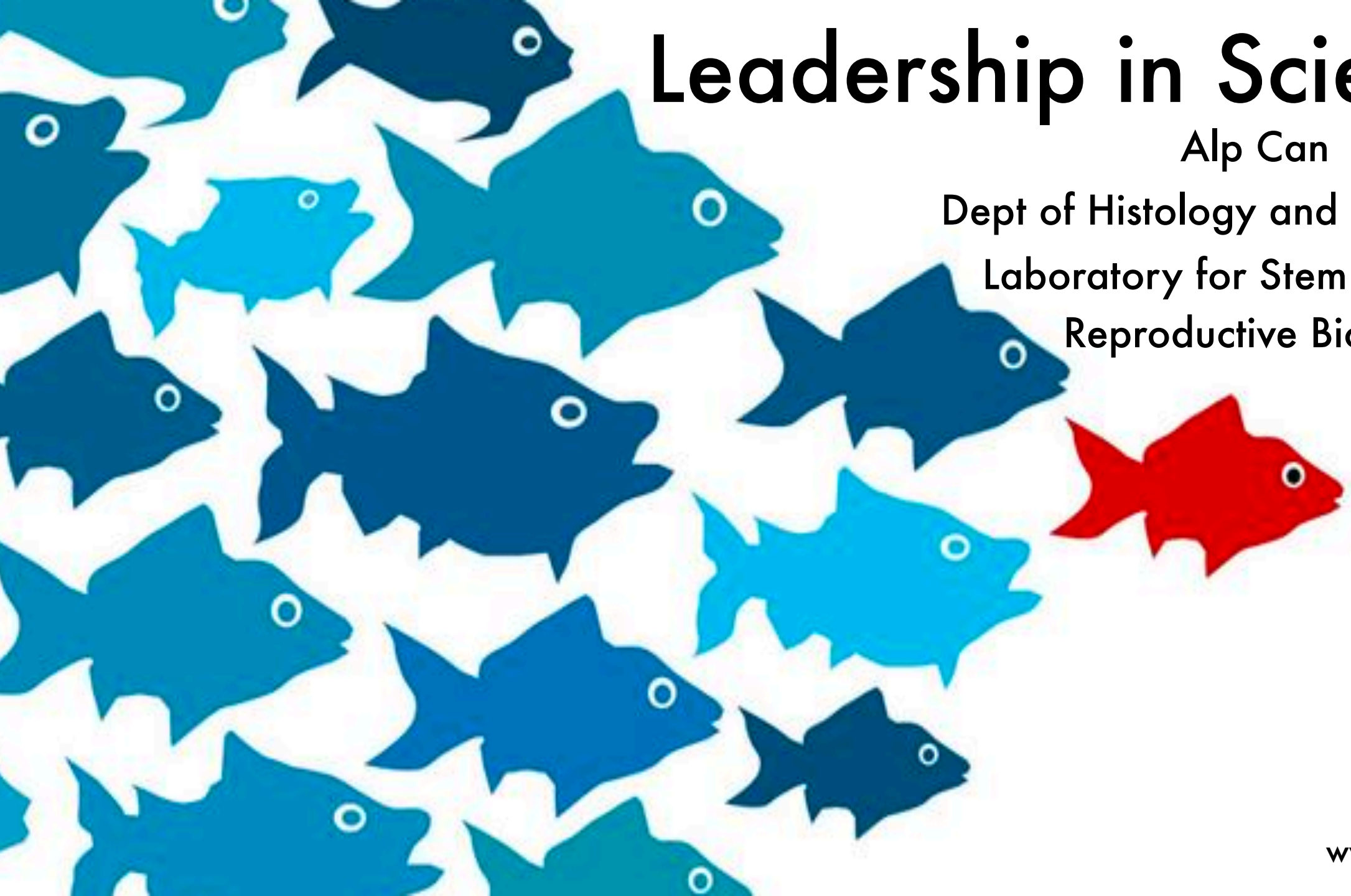
Leadership in Science

Alp Can
Dept of Histology and Embryology
Laboratory for Stem Cells and Reproductive Biology



www.alpcan.com


Coming together is a beginning. Keeping together is progress. Working together is
Success

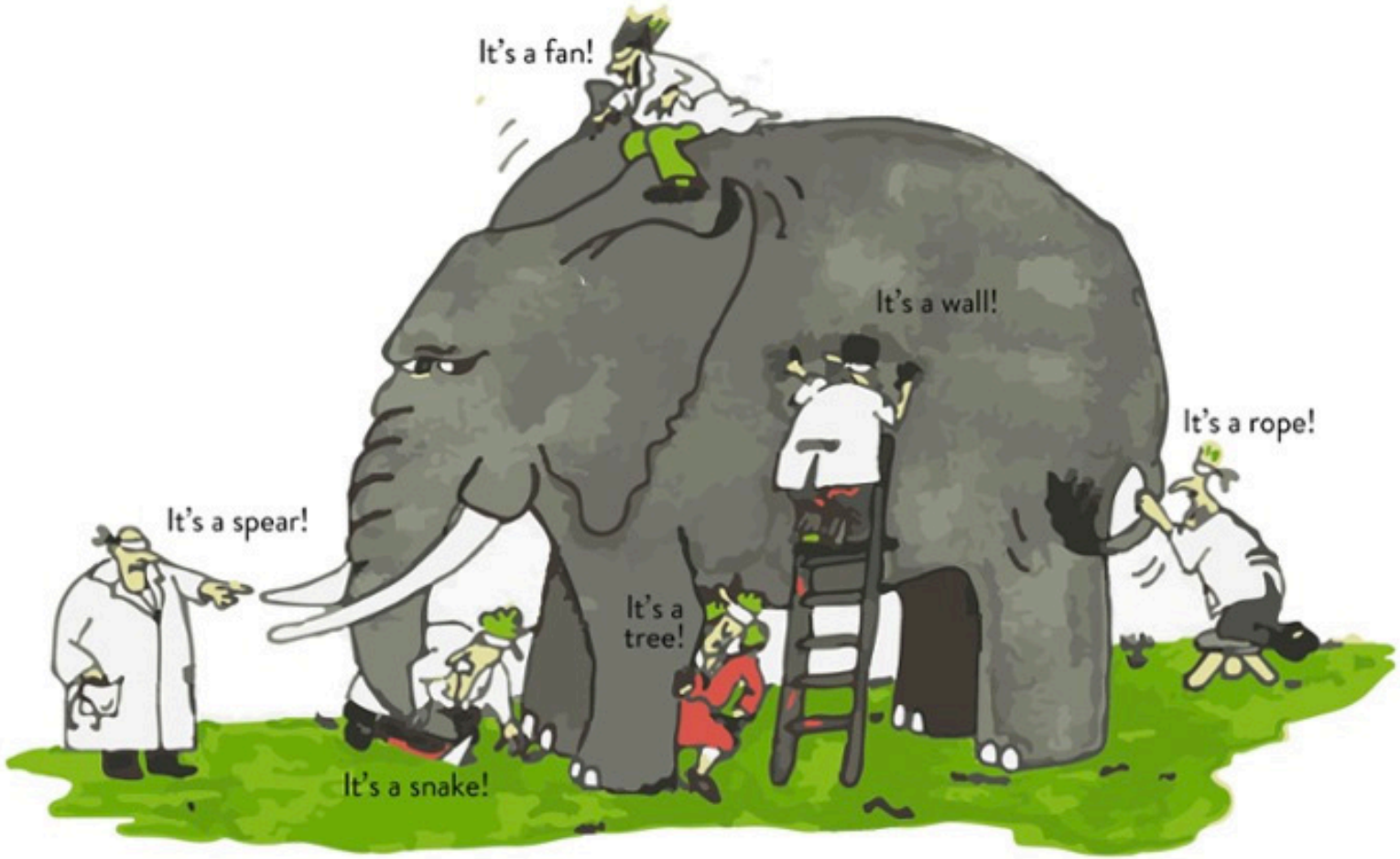

Together
Everyone
Achieves
More

Our Task

Seeing the Big Picture!

PI's Vision

It's an elephant



PI: Principal investigator (the chief scientist in a science lab)

What is Science and What is Not Science

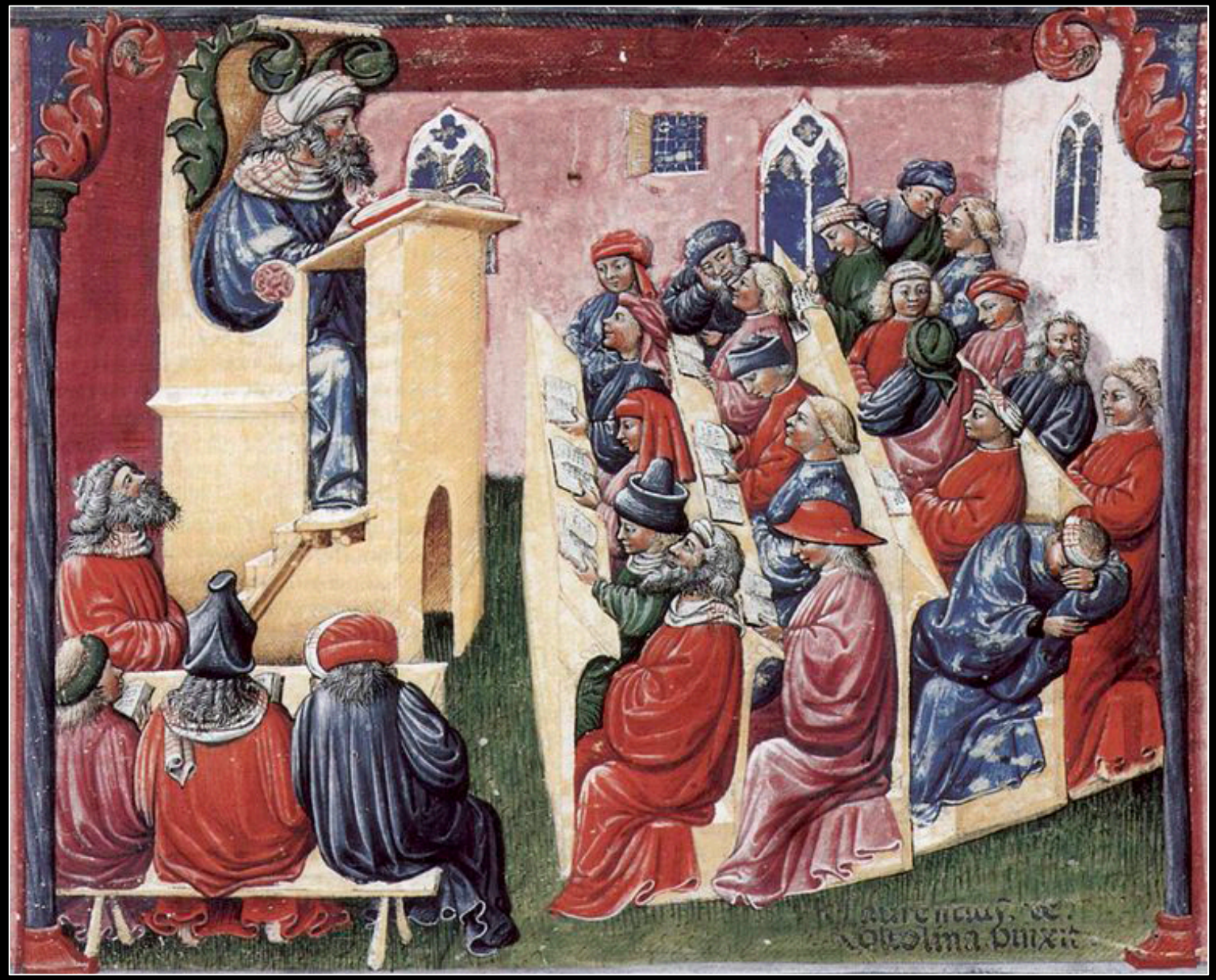
- The product of **science** (probable explanations for natural phenomena) are always based on observations carefully analyzed and tested.
- It's **not** a process in which the product (understanding) is based on **faith** or **belief**.
- In earlier eras, the human desire to explain natural phenomena linked what was observed with preconceived notions of the world taken from **mythology**, **religion**, and **philosophy**.
- Modern science developed as an alternative way to explain those phenomena, through systematically observing them, and testing ideas about them.

Non-Scientific Methods

- Non-scientific approaches such as philosophy, theology, and art have usefully guided visions of the ‘why’ of our existence, our interactions with one another, or defined morality/ethics.

Pseudo-Science

- Although it might seem scientific to a layman, it encompasses attempts that lack testability and the vigorous peer-review inherent in the scientific process.
  - **Astrology**, for example, has a set of rules and underlying concepts which cannot be tested. The vagueness of its predictions avoid falsification precisely because they are ambiguous.

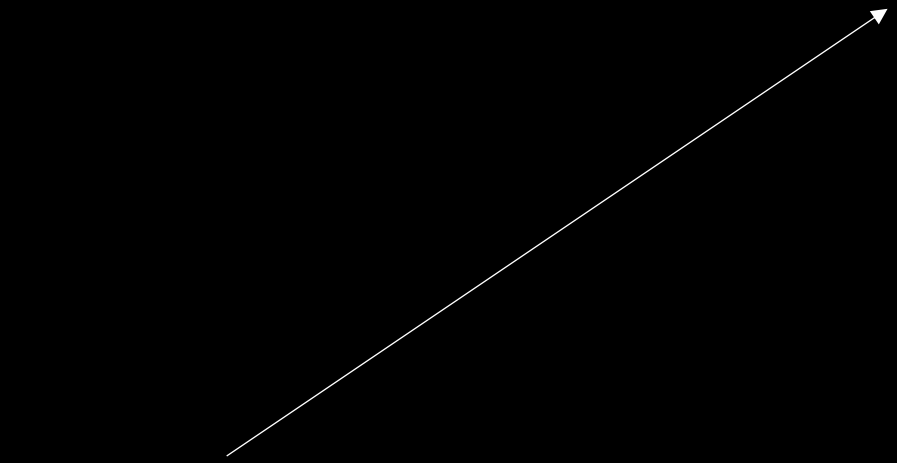


Teaching and Practicing Science

University of Bologna (medieval ages)

Artist: Voltolina (ca. 1350s)

4 Steps to Learn a Skill



You don't know that you don't know how to do something.

Stage 1
Unconsciously
Incompetent

You are unaware of it
You don't ask help…

You know that you don't know how to do something and it bothers you.

Stage 2
Consciously
Incompetent

Tell Me!
Show Me!

You know that you know how to do something and it takes effort.

Stage 3
Consciously
Competent

May I Try?
Let Me Try!

You know how to do something and it is second nature; you rock at it.

Stage 4
Unconsciously
Competent

I Do It

What Do We Do in the Lab?

Ask Questions

Do Background/Literature Research

Contruct a Hypothesis

Test with Experiments

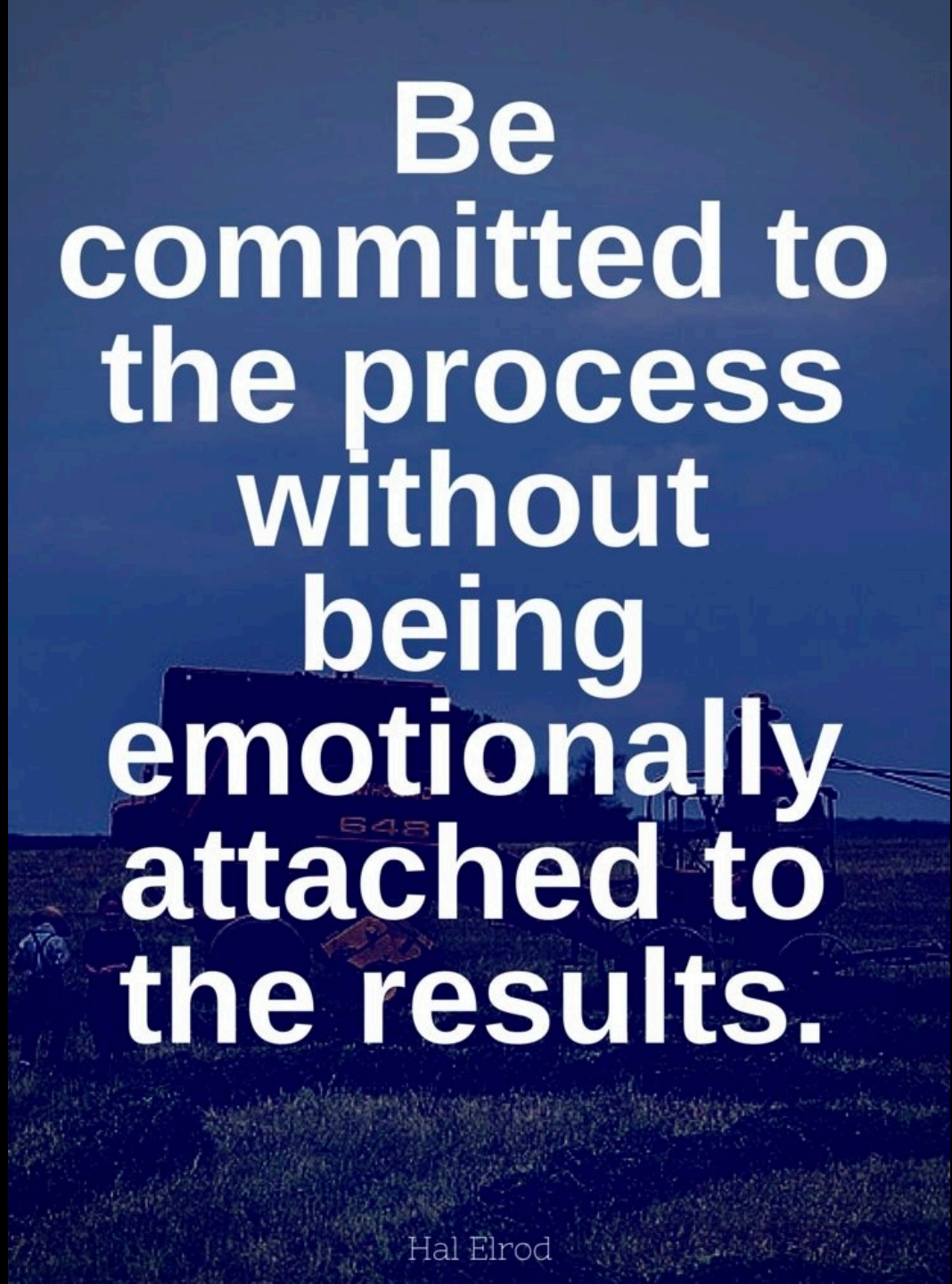
Analyze Results

Make Clear Conclusion(s)

Hypothesis is True

Hypothesis is False or Partially True

Report Results



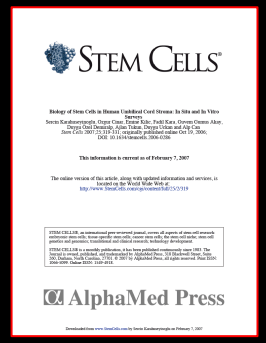
An example of a Team Work over 17 years
(A total of 23 scientist worked during this period)

2003 — Isolation of human umbilical cord MSCs from term deliveries

2004 — Cellular characterization of hUC-MSCs in vitro

2005 — Assessing the stem cell properties of hUC-MSCs

2007 — Biology of the stem cells in human umbilical cord stroma: In situ and in vitro surveys



Stem Cells 25(2): 319-331, 2007.

2007 — Human umbilical cord stroma with regard to the source of fetus-derived stem cells

Stem Cells 25(11): 2886-2895, 2007.

2008 — Cellular and molecular phenotypes during differentiation of hUC-MSCs into fat storaing cells

Stem Cells 26(3): 682-691, 2008.

Timeline of studies by A. Can and coworkers in human umbilical cord-mesenchymal stem cells

2009

The use of hUC-MSCs in various disease models

Cell and Tissue Biology Research, 2:1–7, 2009.

2010

Reprogramming of hUC-MSCs to differentiate into muscle cells

Stem Cell Reviews &Reports 6: 512–522, 2010.

2011

A novel nucleolar protein (NS) to predict the stem cell potential of hUC-MSCs

Stem Cell Reviews & Reports 7: 413–424, 2011.

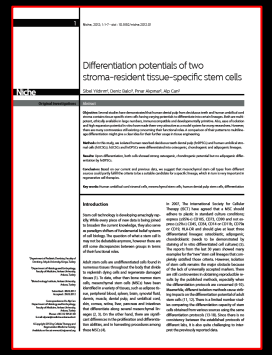
2011

Standardization of isolation, culture and characterization conditions of hUC-MSCs

Methods in Molecular Biology 698: 51–62, 2011.

2012

Comparing the differentiation potentials of hUC-MSCs and dental pulp stem cells



Niche, 1: 1-7, 2012.

2013

Assessment of cryopreservation conditions of hUC-MSCs for banking

Current Stem Cell Research & Therapy 8: 60–72, 2013.

Timeline of Studies by A. Can et al in human UC-MSCs

2015

The assessment of the in vivo to in vitro cellular transition of human umbilical cord multipotent stromal cells

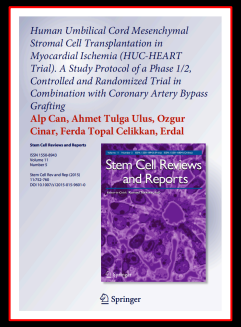
Placenta 36: 232-239, 2015.

2015

Approval of HUC-HEART Project

2015

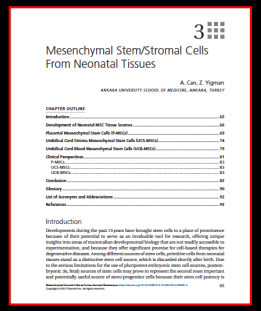
Study design of HUC-HEART Trial Published



Stem Cell Reviews &Reports 11: 752–560, 2015.

2016

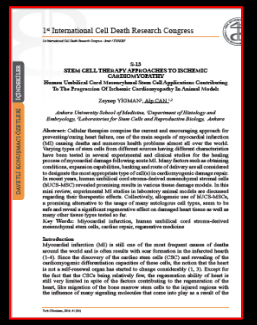
Mesenchymal Stromal Cells as Tumor Stromal Modulators Chapter 3: 65-102, 2017.



Mesenchymal Stromal Cells as Tumor Stromal Modulators Chapter 3: 65-102, 2017.

2016

Human umbilical cord mesenchymal stem cell applications contributing to the progression of ischemic cardiomyopathy in animal models



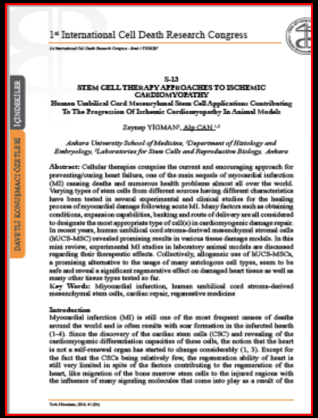
Turkish Journal of Biochemistry 41: 31-35, 2016

Timeline of studies by A. Can and coworkers in human umbilical cord-mesenchymal stem cells

2017

Patent Registered 2010-05578: *Cryopreservation of Human Umbilical Cord Stroma*


T.C.
TÜRK PATENT VE MARKA KURUMU
İNCELEMELİ PATENT
No: TR 2010 05578 B
Bu patent, 08. 07. 2010 tarihinden itibaren 20 yıl süre ile incelemeli olarak verilmiştir
Prof. Dr. Habip ASAN
Türk Patent ve Marka Kurumu Başkanı
TURK PATENT

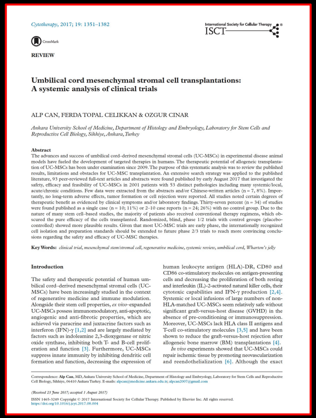

1st International Cell Death Research Congress
S-13
STEM CELL THERAPY APPROACHES TO ISCHEMIC CARDIOMYOPATHY
Human Umbilical Cord Mesenchymal Stem Cell Applications Contributing To The Progression Of Ischemic Cardiomyopathy In Animal Model
Zeynep YIGMAN, Alp CAN

2017

Preliminary Results of HUC-HEART Trial

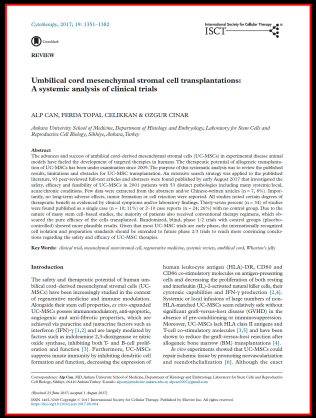
2017

Umbilical Cord Mesenchymal Stromal Cell Transplantations: A Systemic Analysis of Clinical Trials


Cytotherapy, 2017; 19: 1351–1382
REVIEW
Umbilical cord mesenchymal stromal cell transplantations: A systemic analysis of clinical trials
ALP CAN, FERDA TOPAL CELIKKAN & OZGUR CINAR

2019

Optimizing the Transport and Storage Conditions of cGMP grade HUC-MSCs for Transplantation (HUC-HEART Trial)


Cytotherapy, 2017; 19: 1351–1382
REVIEW
Umbilical cord mesenchymal stromal cell transplantations: A systemic analysis of clinical trials
ALP CAN, FERDA TOPAL CELIKKAN & OZGUR CINAR

2020

Intramyocardial Transplantation of Umbilical Cord Mesenchymal Stromal Cells in Chronic Ischemic Cardiomyopathy. A Randomized, Controlled Clinical Trial (HUC-HEART Trial)

in press
American Heart Journal

2020

The Rationale of Using Mesenchymal Stem Cells in Patients with COVID-19–related Acute Respiratory Distress Syndrome: What to Expect

in press
Stem Cells and Translational Medicine

Timeline of studies by A. Can and coworkers in human umbilical cord-mesenchymal stem cells

Science Laboratory Team

- Principal Investigator(s) (PI)
- Research Associates
  - Post-Docs (Post-Doctoral Fellows)
  - Research Assistants
- Graduate Students
  - Doctoral (PhD) students
    - Medical School
    - Biology/Biotechnology
  - Master (MS) students
- Undergraduate Students
- Supporting Staff
  - Technicians
  - Secretary
  - Lac safety expert
  - Animal care expert
  - Supplier expert

Some Basic Rules In a Science Lab (for students)

- Be Clean and Tidy
- Learn Chemicals, Consumables and Devices
- Follow Your Scientific Hypothesis, Do Not Deviate
- Learn How to Manage Your Time
- Chat with Other Staff About Their Projects
- Write What You Did, Do What You Write
- Keep Your Phone Away from the Bench
- Check Your Mails, Text Messages Only A Couple Times a Day

Some Basic Rules In a Science Lab (for Principal Investigators)

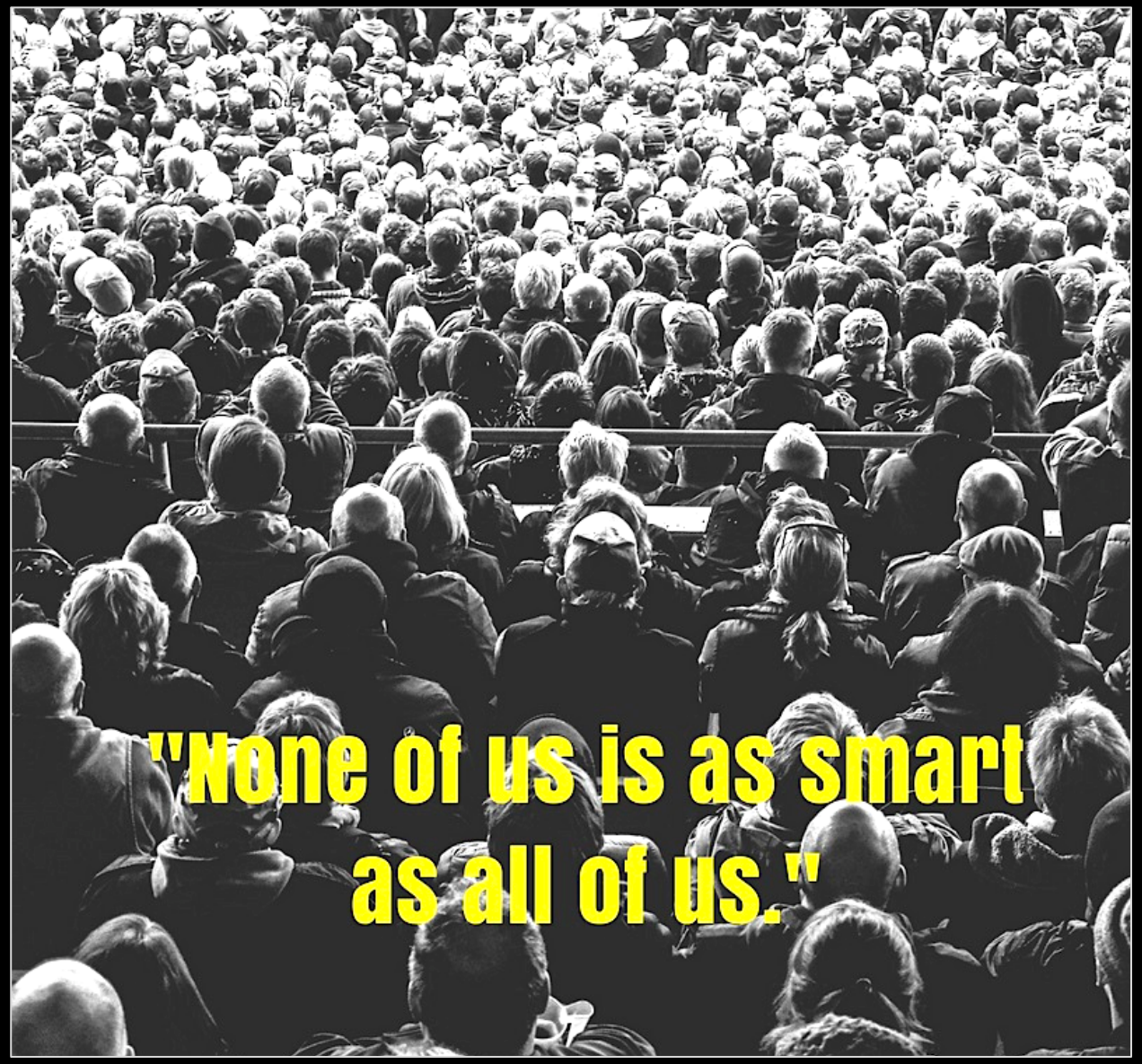
- Don't Forget These;
  - Leadership is an action, not a position!
  - The key to successful leadership is influence, not authority!
  - The greatest leader is not necessarily the one who does the greatest things. He is the one that gets the people to do the greatest things!
  - A successful person finds the right place for himself. But a successful leader finds the right place for others.
  - If your actions create a legacy that inspires others to dream more, learn more, do more and become more, then, you are an excellent leader.
  - Leaders are made, they are not born. They are made by hard effort, which is the price which all of us must pay to achieve any goal that is worthwhile.
- Keep Your Phone Away from the Bench!
- Check Your Mails, Text Messages Only A Couple Times a Day!


EMPOWER PEOPLE
INSPIRE PEOPLE
LEADERSHIP
LEAD CHANGE
SHARED VISION

Some Basic Facts About Lab Management

- The bigger your group is, the less face-to-face time you're going to have.
- Laboratory size affects not only the principal investigator (PI), but also the other members of a research group. Postdocs and graduate students should think about the scope and scale of a lab when choosing a place to work.
- Adding a funded postdoc to the average lab boosts output by about 29% of a published paper every year.
- The size and structure of a lab can be hugely important, but in the end, the quality of any workplace comes down to the quality of the people.

It is Always Good to Be a Member of a Scientific Team



Last Message

Stay with science...
Stay with art...

Stay at home on those COVID-19 days !...