MIT BIOLOGICAL ENGINEERING
COMMUNICATION LAB

Untitled
Mark Rothko, 1968
Phillips Collection (Washington, DC)

20.109 Communication Workshop 2: Titles and Abstracts (+ some writing basics)

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BE Communication Lab Instructors

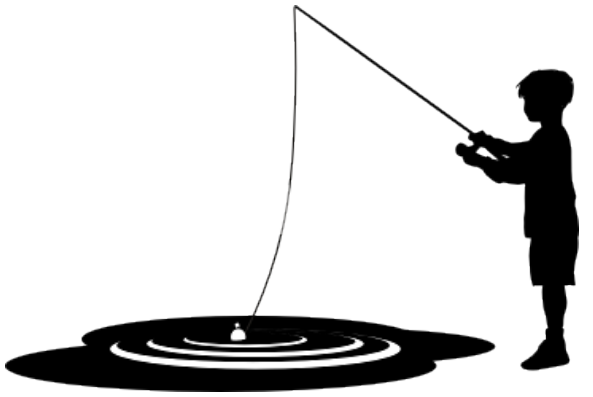
Helping you communicate effectively.
be.mit.edu/communicationlab

Titles & Abstracts:
Why do they matter?

Attracting your audience: first judgment

Influencing whether someone will read or cite your paper

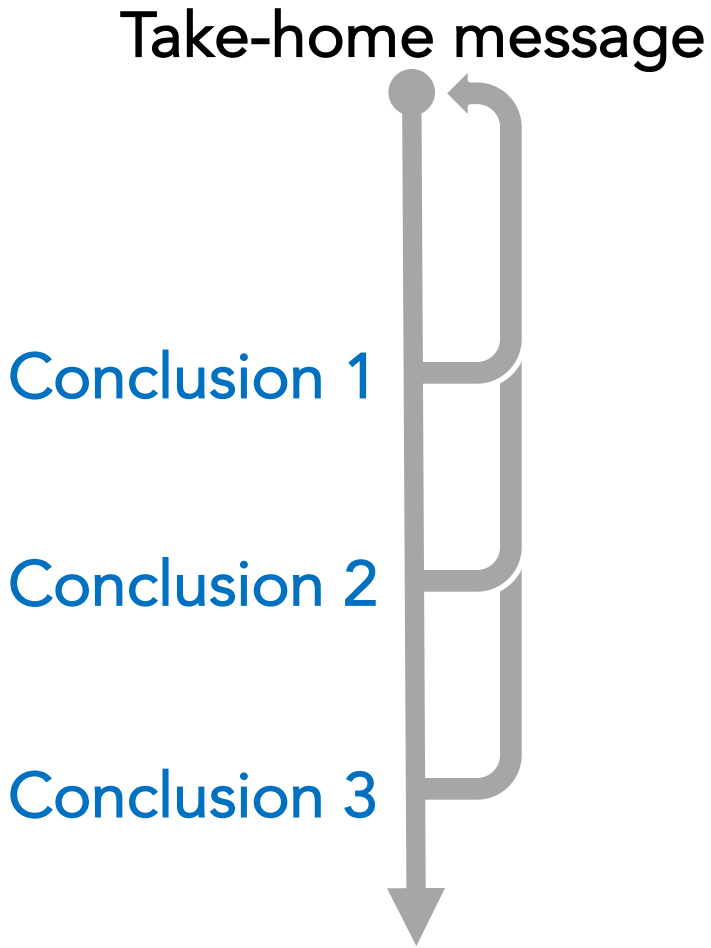
Indexing – Will readers even find your paper?



Titles & Abstracts:
Who is your audience?

- People in your field
- Editors, reviewers
- Researchers outside your field
- Students like you!
- Reporters
- Funders, politicians
- Anyone looking for information

Your abstract and title convey your central hypothesis and take-home message.



Why was this an important study?

How does it further scientific thinking?

Why should anyone read your paper?

Titles

Think about the last lit search you did.

You probably picked what to read based largely on the title!

Search results

Items: 1 to 20 of 573

<< First < Prev Page 1 of 29 Next > Last >>

1. Onychomycosis due to dermatophytes species in Iran: Prevalence rates, causative agents, predisposing factors and diagnosis based on microscopic morphometric findings.
   Babayani M, Salari S, Hashemi SJ, Ghasemi Nejad Almani P, Fattahi A.
   J Mycol Med. 2018 Feb 12. pii: S1156-5233(17)30288-3. doi: 10.1016/j.mycmed.2017.12.009. [Epub ahead of print]
   PMID: 29449074
   Similar articles

2. The *Troika* Host-Pathogen-Extrinsic Factors in Tuberculosis: Modulating Inflammation and Clinical Outcomes.
   Bastos HN, Osório NS, Gagneux S, Comas I, Saraiva M.
   Front Immunol. 2018 Jan 9;8:1948. doi: 10.3389/fimmu.2017.01948. eCollection 2017. Review.
   PMID: 29375571 **Free PMC Article**
   Similar articles

3. Assessment of ocular toxoplasmosis patients reported at a tertiary center in the northeast of Iran.
   Hosseini S, Moghaddas E, Sharifi K, Moghaddam MD, Shamsian SA.
   Int Ophthalmol. 2018 Jan 15. doi: 10.1007/s10792-017-0764-3. [Epub ahead of print]
   PMID: 29335806
   Similar articles

4. Fauna, Ecological Characteristics, and Checklist of the Mosquitoes in Mazandaran Province, Northern Iran.
   Nikookar SH, Fazeli-Dinan M, Azari-Hamidian S, Nasab SNM, Aarabi M, Ziapour SP, Enayati A, Hemingway J.
   J Med Entomol. 2018 Jan 6. doi: 10.1093/jme/tjx228. [Epub ahead of print]
   PMID: 29325101
   Similar articles

5. On the relationship of anthranilic derivatives structure and the FXR (Farnesoid X receptor) agonist activity.
   Kronenberger T, Windshügel B, Wrenger C, Honorio KM, Maltarollo VG.
   J Biomol Struct Dyn. 2018 Jan 10:1-14. doi: 10.1080/07391102.2017.1417161. [Epub ahead of print]
   PMID: 29237358

Effective titles are messages:

What did you find? So what?

A survey of small molecules with ligand binding activity

vs.

Conserved hydroxyl and carbonyl ligand structures are implicated in high-affinity receptor binding

Frame titles for your audience

The level of detail can vary for the same paper

Inulin modulates conspecific antagonism towards vancomycin-resistant *B. subtilis* strain BF819 in the human gut microbiome

vs.

A human gut commensal exhibits targeted antagonism towards an antibiotic-resistant clinical counterpart

Build and simplify your title with key terms

KEY NOUNS

KEY VERBS

Novel methods for early prediction of undesirable interference by microbial inhabitants of the human gut with metabolism of the cardiac drug digoxin give rise to strategies for alleviating drug inactivation

NEW AND IMPROVED TITLE

Predicting and alleviating drug interference by human gut microbiome

TOO SIMPLIFIED = LESS INFORMATIVE

Novel methods for prediction of drug interference

How might we modify this title?

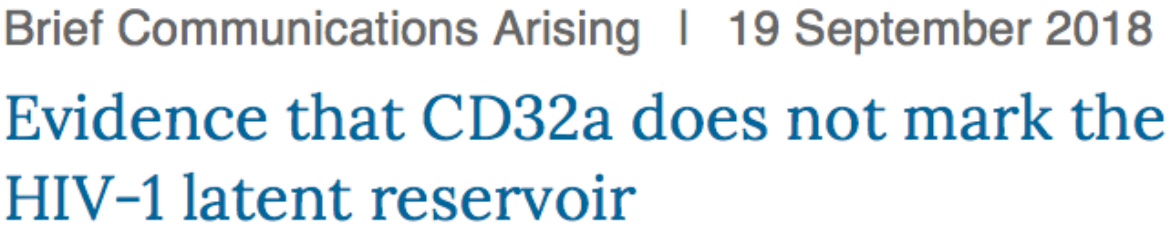
Surveying somatic mutations in P53, EGFR, BRCA1, and HRAS for impact on MCF7 tumors with heterogeneous cell composition.

Replace jargon to attract a broader audience

Surveying the impact of breast cancer oncogenes on tumor heterogeneity

If your story doesn't seem conclusive, what can you do?

- Tell your story in a different way--focus on the technology? what did you learn?
- Convey a message of negative results



- Write a descriptive title that is as clear and interesting as possible

Abstracts

Unscramble this real abstract

In 5 minutes:

- Read all the sentences
- Look for signaling language
- Number the sentences in logical order

Clonal dynamics of native haematopoiesis.

Nature. 2014 Oct 16; 514(7522): 322–327.
Sun J, Ramos A, Chapman B, Johnnidis JB, Le L, Ho YJ, Klein A, Hofmann O, Camargo FD.

Assemble this abstract

1. It is currently thought that life-long blood cell production is driven by the action of a small number of multipotent haematopoietic stem cells.

2. Evidence supporting this view has been largely acquired through the use of functional assays involving transplantation.

3. However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear.

4. Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled *in situ* to address this question.

5. Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis.

6. In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny.

7. Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood.

8. Our results also have implications for understanding the cellular origin of haematopoietic disease.

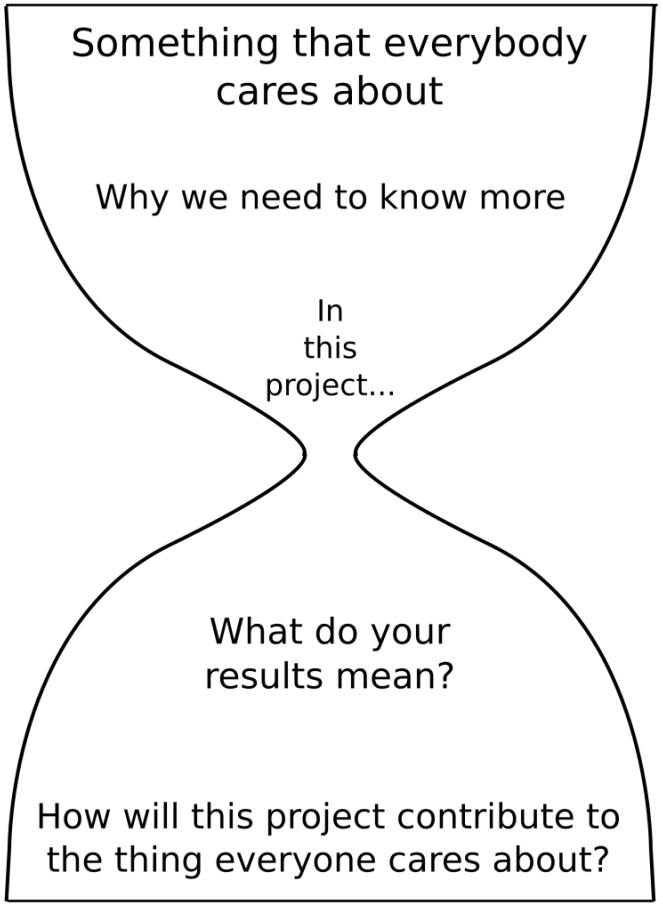
Clonal dynamics of native haematopoiesis.

Sun J, Ramos A, Chapman B, Johnnidis JB, Le L, Ho YJ, Klein A, Hofmann O, Camargo FD.

Abstract

It is currently thought that life-long blood cell production is driven by the action of a small number of multipotent haematopoietic stem cells. Evidence supporting this view has been largely acquired through the use of functional assays involving transplantation. However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear. Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled in situ to address this question. Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis. In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny. Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood. Our results also have implications for understanding the cellular origin of haematopoietic disease.

An effective abstract is an hourglass-shaped message.



General background

Specific background

Knowledge gap, Unknown

HERE WE SHOW…

Results

Implication

Significance

The hourglass structure mapped onto our abstract

1. It is currently thought that life-long blood cell production is driven by the action of a small number of multipotent haematopoietic stem cells.

General background

2. Evidence supporting this view has been largely acquired through the use of functional assays involving transplantation.

Specific background

3. However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear.

Knowledge gap, Unknown

4. Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled *in situ* to address this question.

HERE WE SHOW…

5. Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis.

Results

6. In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny.

Results

7. Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood.

Implication

8. Our results also have implications for understanding the cellular origin of haematopoietic disease.

Significance

The knowledge gap and “here we show” are next to each other, creating a logical flow for the reader.

However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear.

Knowledge gap, Unknown

Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled *in situ* to address this question.

HERE WE SHOW…

argument = claim + evidence + reasoning

Claim	A statement of our understanding about a phenomenon, about the outcome of a study, or about the author's view of the field
Evidence	Data to support the claim
Reasoning	Justification of the claim that shows **how** the evidence specifically supports the claim

Your abstract should contain at least one claim, which is your take home message

Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled *in situ* to address this question.

HERE WE SHOW… (CLAIM)

Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis.

Results (Evidence)

In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny.

Results (Evidence)

Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood.

Implication (Reasoning)

Your "here we show" sentence relates directly to your report's take-home message

samples of "Here we show" from 20.109 student abstracts

Here we show the functionality of the CometChip Assay by testing the CometChip assay's cell loading capabilities and quantifying the amount of DNA damage resulting from oxidation.

or

This study examines the impacts of H2O2 and MMS, two DNA damaging agents, on mouse embryonic fibroblast strains that are wild-type or mutant for enzymes in the base excision repair pathway.

Include key results that support your take-home

Take-home message

This study examines the impacts of H2O2 and MMS, two DNA damaging agents, on mouse embryonic fibroblast strains that are wild-type or mutant for enzymes in the base excision repair pathway.

Results

We found that MMS (a base methylating agent) and H_2O_2 (a base oxidizing agent) caused DNA damage that was detectable by the CometChip assay. We also found that knocking out the enzymes that remove these damaged bases (Aag and Ogg respectively) in the BER pathway did not affect detected DNA damage. If Aag was added back or the MMS incubation time was increased, however, more damage was revealed in the knockout.

Include a minimal description of your key methods, (if it aligns with your message)

The rate and extent to which the different cell types respond to the chemical treatments will be determined, in addition to their capacity to maintain genomic stability. In order to determine the percentage of damaged DNA, the DNA was embedded in a gel agar and subjected to electrophoresis at high pH to allow the damaged DNA to segregate from the nucleus. The intensity of DNA that migrated away from the nucleus into what looks like a comet tail corresponded to the amount of damaged DNA in that particular cell and the extent to which the BER pathway repaired the damage.

Too much for an abstract

To detect for DNA single-stranded and double-stranded breaks, the CometChip assay and immunofluorescent staining were used, respectively.

Signaling words help guide the reader

Question + Experiment	Results	Answer/ Conclusion	Implication
To determine whether…, we…	We found…	We conclude that…	These results suggest that…
We asked whether…	Our results show…	Thus,…	These results may play a role in…
To answer this question, we…	Here we report…	These results indicate that…	Y can be used to…
X was studied by…			

Read lots of abstracts and collect useful phrases, choose clarity over originality.

Tense in abstracts is a little tricky

Present Tense

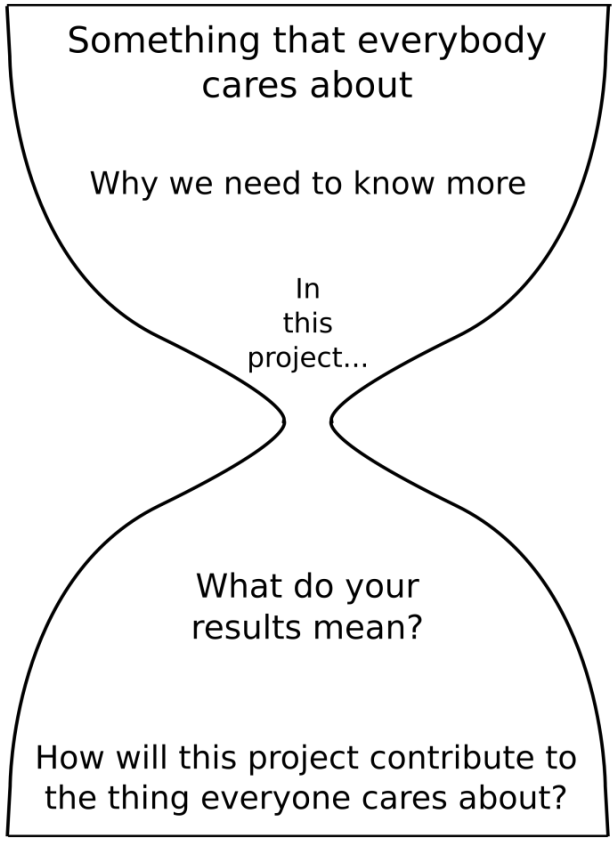
Past Tense

Abstract

It is currently thought that life-long blood cell production is driven by the action of a small number of multipotent haematopoietic stem cells. Evidence supporting this view has been largely acquired through the use of functional assays involving transplantation. However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear. Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled in situ to address this question. Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis. In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny. Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood. Our results also have implications for understanding the cellular origin of haematopoietic disease.

When drafting your abstracts and titles, consider these questions.

1. What is the problem?
2. Where is the gap?
3. What did you do?
4. What is the implication?



Quick Writing Improvements

Word Choice:

Choose the right word for the context.

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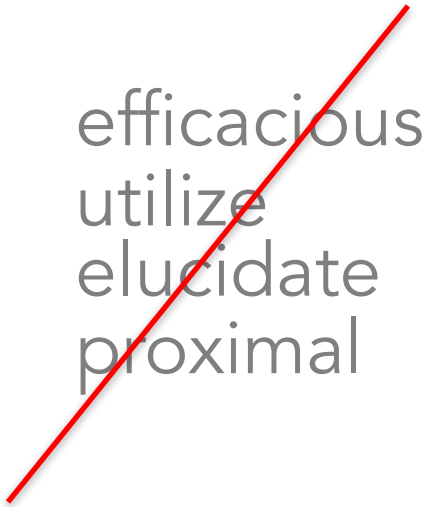
Choose the right word for the context.

- The response was blocked by phentolamine but was not *affected* by propanolol.
- The digoxin *concentration* was increased from 0.5 to 2.5 ng/ml.
- At frequent *intervals* we measured pH, P_{O_2} and P_{CO_2} in arterial blood, and during each *period* of study we measured pulmonary blood flow two or three times.
- 75 percent nitrous oxide *is* a subanesthetic concentration in the dog.

Word Choice: Simplify.



efficacious	effective
utilize	use
elucidate	explain
proximal	close

Word Choice: Be quantitative.

development rate was fastest at the higher temperature

development rate at 30°C was 10% faster than at 20°C

Sentence Structure:

Make the topic the subject.

The patient showed no change in symptoms.

The patient's symptoms did not change.

Provide a logical relationship between your sentences with transition phrases.

As a result,…
Given this observation,…
According to this theory,…
In order to accomplish…

Protip: Avoid novelty claims.

- Unless you've read every paper, you don't really know if you're the first to discover something.
- A surprising result: unanticipated, or against common dogma, but not unprecedented
- Appropriately qualified, there are certain "firsts" you do know…

Take-homes for Titles and Abstracts:

- Highlight your take-home message: identify your research question & your contribution
- Focus on findings, not methods.
- Be succinct.
- Be quantitative.

When drafting your abstracts and titles, consider these questions.

1. What is the problem?
2. Where is the gap?
3. What did you do?
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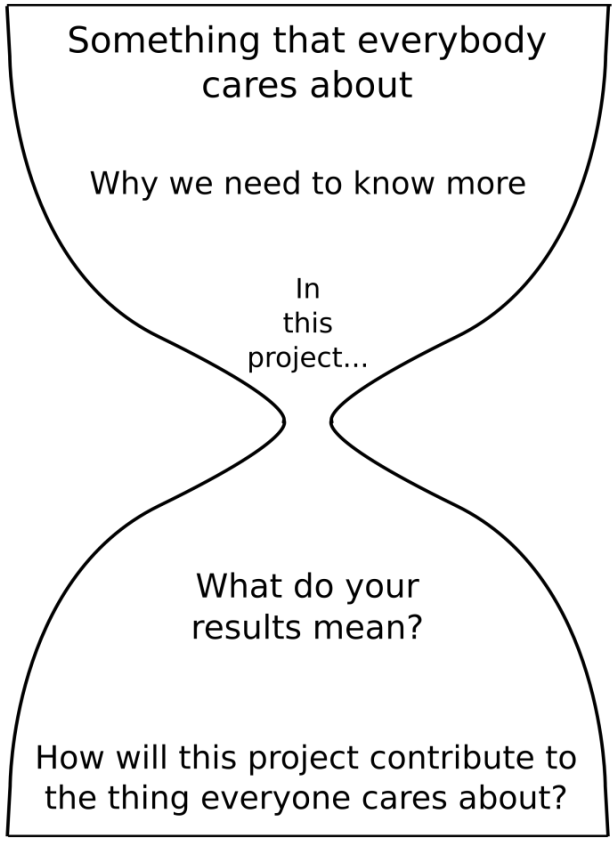
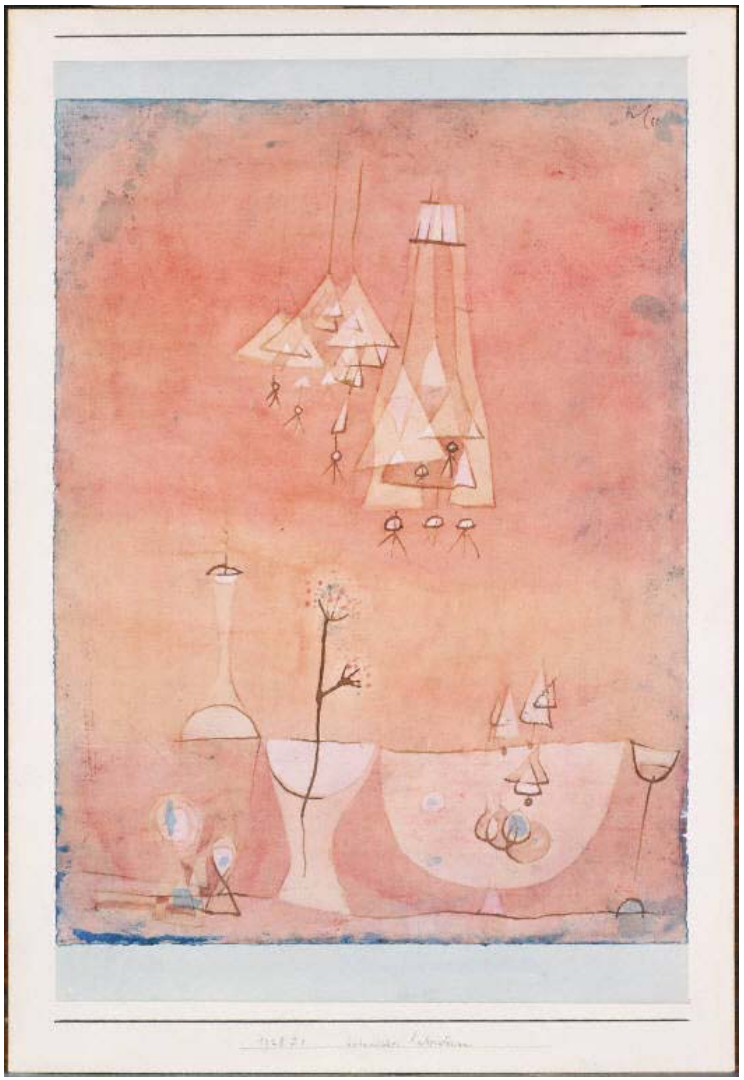


To the lab!



Botanical Laboratory
1928, *Paul Klee (1879-1940)*

Unscramble this abstract

Evidence supporting this view has been largely acquired through the use of functional assays involving transplantation.

Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis.

Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood.

It is currently thought that life-long blood cell production is driven by the action of a small number of multipotent haematopoietic stem cells.

Our results also have implications for understanding the cellular origin of haematopoietic disease.

Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled in situ to address this question.

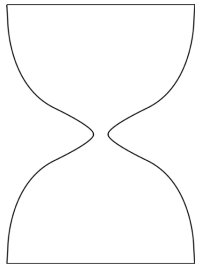
However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear.

In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny.

Choose the right word for the context.

- The response was blocked by phentolamine but was not *(affected, effected)* by propanolol.
- The digoxin *(amount, concentration, content, level)* was increased from 0.5 to 2.5 ng/ml.
- At frequent *(intervals, periods)* we measured pH, P_{O_2} and P_{CO_2} in arterial blood, and during each *(interval, period)* of study we measured pulmonary blood flow two or three times.
- Seventy-five percent nitrous oxide *(represents, is)* a subanesthetic concentration in the dog.

Here are the components of an effective abstract



General background	Something everyone in your audience cares about
Specific background	Zoom in from General Background toward what you did
Knowledge gap, Unknown	Question that will be answered by your research, or a problem, phenomenon that is not understood
HERE WE SHOW	Conclusion, answer to the Unknown
Results	Brief summary of approach + very high-level results. Common pitfall = too much of Methods/Results
Implication, Significance	So what? What do your results mean for the thing everyone cares about? Next steps?