## Guide to read scientific papers:

#### A scientific publication...

- 1. Peer-reviewed writing on novel contribution to research field
- 2. Accessible to the public through journals, websites, blogs
- 3. Provides results, techniques, and interpretations that are important to other researchers

# Guide to read scientific papers:

- 1. Why are you reading article?
- 2. Three-pass guide:
  - a. The quick pass
  - b. The active read
  - c. The summary
- 3. How to search for and access papers
- 4. Keeping up with the literature

# Why are you reading article?

- 1. Compare your results with published findings.
- 2. to get info about a topic you are stuck on.
- 3. background on research.
- 4. future directions/questions

### Why are you reading article?

## COMPETENCE

Build knowledge of field

## CONTEXT

How research fits in field

## CURRENT

What's new in field

## COMPARISON

Your results to published findings

#### Search for & access journal articles

#### SEARCH -

- 1. Google scholar
- 2. journal feeds
- 3. arXiv
- 4. Web of Science

#### Some recommended journals:

Science Nature

Physical Review Letters Physics Today

PNAS Scientific American

Soft Matter Granular Matter

ACCESS – most articles via college library

## The quick pass

- 1. Assess paper structure and writing style
  - a. Title and abstract key words
  - b. Introduction why authors performed study, research argument
  - c. Methods what authors did
  - d. Results what they found
  - e. Discussion how they interpret what they found in context of field
- Read title and abstract and identify most important figures
- 3. Read accompanying summary, if available.

### The quick pass

Through quick pass, you should learn:

- 1. Type of paper review, seminal paper, new technique, minor advancement,...
- 2. Paper's big picture
- 3. If paper meets your reading goals

# What if there's a term or jargon you don't understand?

- 1. highlight words search in Google write definition next to word.
- a. Use context from paragraph.
  - 3. figures may help.

# What if there's a term or jargon you don't understand?

Here are a few things you can do:

- 1. Quick search for term online on reputable sites, ex. Wikipedia, course sites
- 2. Scan review article or textbook chapter to get appropriate background
- 3. See the citation for additional info.

#### The active read

- 1. Read carefully highlighting and commenting as you read
- 2. Interpret diagrams and figures then read captions
- 3. Mark references for further reading and background literature

#### The active read

#### Questions to consider while reading:

- 1. Main points?
- 2. Your research questions?
- 3. Why did authors conduct experiment or simulations in that way?
- 4. Sufficient data to support conclusions?
- 5. Which results are most compelling?
- 6. Reported quantities, parameters, and analysis methods?

### The summary

Write your own notes about the article, including:

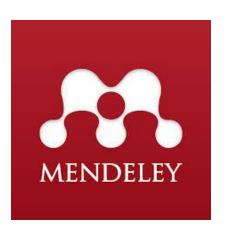
- 1. Summarize main points in your own words
  - 1. supporting evidence/methods
  - 2. important figures
- 2. Ideas or questions you have after reading article
- 3. Jargon you learned
- 4. Weak points or limitations

Save your notes with the article for future reference

#### Keeping up with the literature

MONITOR – journal feeds via email updates or Feedly and through social media

ORGANIZE - Use chosen platform to organize articles by topic



#### References

https://www.sciencemag.org/careers/2016/03/how-seriously-read-scientific-paper

https://www.sciencemag.org/careers/2016/11/how-keep-scientific-literature

https://web.stanford.edu/class/ee384m/Handouts/HowtoReadPaper.pdf

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