Read [Whitesides’ Group: Writing a paper](https://www.tulane.edu/~lamp/whiteside.pdf).

* Start drafting the paper the moment that you have a point to make, or a hypothesis to test.
* Bring this draft to all future meetings until the paper is finished.

**Title of the paper**

You can always give multiple titles for now

**Authors (order is tentative)**: Try to determine the list as soon as you can. You can always change later

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**One-sentence or two-sentence summary of the point of the paper:** Write this short summary now. You can always refine it or change it. Example: Degradable polymers commonly erode by hydrolysis, but hydrolysis makes cracks greatly outrun erosion.

**Suggested Journals:** List as many as you want. You can always change later.

**Suggested reviewers:** List as many as you want. You can always change later.

**Abstract:** Write the abstract as soon as you can, and keep refining it. The abstract should make the title of the paper clear, if it is not clear by itself. Each sentence in the abstract will be supported by the main text.

[How to construct a Nature summary paragraph](https://www.nature.com/documents/nature-summary-paragraph.pdf). A helpful guide even if you are not writing for Nature.

**What is the problem?**

**Sentences for general audience**. Example: Lithium-ion batteries are the batteries of choice for diverse applications, especially for those sensitive to size and weight, such as portable electronics and electric cars.

**Sentences for a specific audience**. Example: Recent experiments have shown that silicon nanofibers can absorb and desorb enormous amounts of lithium without fracture.

**What is new**? Example: Here we show that lithiated silicon is capable of inelastic deformation. Example: We further show that at a sufficiently small length scale, lithiated silicon does not store enough elastic energy to cause fracture. Example: We hypothesize that a highly entangled polymer network has both high modulus and high fatigue threshold.

**Who cares**?Example: Our work shows that high-capacity energy storage is achievable by using inelastic hosts.

**Further background**

Be specific about prior work

**What is the approach?**

**What is the surprise?**

**What have we done?**

* Figures. Careful caption for each figure. Make the caption a self-contained story. We can always move some of the captions to the main text later.
* Equations. Careful interpretation for each equation. Write derivations carefully so that other people can repeat your derivations.
* Experimental methods: Write all details so that other people can repeat your experiments
* Simulation: Write all details so that other people can repeat your simulations.

**To-do list.**

Be explicit about what to do, how to do it, and who will do it. Also say why an item needs to be done if it is not obvious.

1. Example: Measure toughness of the hydrogel using the pure shear test (**Widusha**)
2. Example: Check if the measured fracture energy depends on the thickness of the sample (**Widusha**).
3. Example: Derive an approximate expression for the critical fluid pressure by using the shear-lag model (**Qihan**)
4. Example: Compare this expression with the results of the finite element simulation (**Qihan**). This comparison is important because the model has several assumptions.

**References**

When VPN is on, many papers are accessible as HTML files on the journal websites. Make links to the HTML files, so that papers are readable on all devices, including phones, without download.

2021 Choi [Basic principles of hydrogel-based tissue transformation technologies and their applications](https://doi.org/10.1016/j.cell.2021.07.009)

2019 Choi-Kim [High-performance stretchable conductive nanocomposites](https://pubs.rsc.org/en/content/articlehtml/2019/cs/c8cs00706c)

Some references are not accessible as HTML files. Please create a folder for the paper in google drive and share with the co-authors. Create a subfolder named “literature”. In this subfolder please place potentially relevant papers. Name each file in the folder in the following format, and make a link in this outline.

1953 Rivlin-Thomas [Rupture of rubber. I. characteristic energy for tearing](https://drive.google.com/file/d/0B8UBSuBlYFWjU0l0dTdkUGhDRlU/view?usp=sharing&resourcekey=0-bsMvdbaqVRz2Q5r3RLP0Vg)