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Decoding the Art of Graphical Abstracts

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Editage Academic Trainer and Consultant

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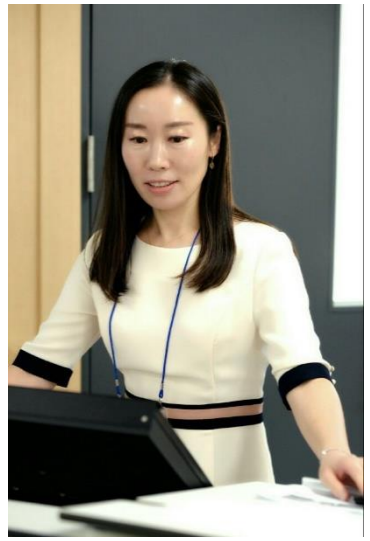
About Me



Mikyoung Lee, PhD

Education

- PhD, Educational Psychology, University of Munich, Germany
- PhD, Science of Nursing, Chonnam National University
- MA, TESOL (Teaching English to Speakers of Other Languages), Sookmyung Women's University
- BA, Science of Nursing, Yonsei University

Research & Work Experiences

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- Academic Trainer & Consultant, Editage
- Assistant Professor, Department of Nursing, Kwangju Women's University
- Guest Researcher, Educational Psychology, University of Munich, Germany
- Reviewer, International Journal of Nursing Studies
- Research Committee Chair, Korea TESOL (대한영어교육학회)
- Editorial Board member, Journal of Korea TESOL
- Research Project, National Research Foundation of Korea (한국연구재단)
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- Former Visiting Scholar, Educational Psychology, University of Texas (UTSA), USA
- Published papers in international & domestic venues (SCI/E, SSCI, SCOPUS, KCI)

Workshop Outline

1. Understanding the Purpose and Impact
2. Artistic Elements
3. Design Thinking
4. Step-by-Step Guidance
5. Summary

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From scientific illustration to our topic today: a graphical abstract

Neurotox Res
DOI 10.1007/s12640-011-9281-8

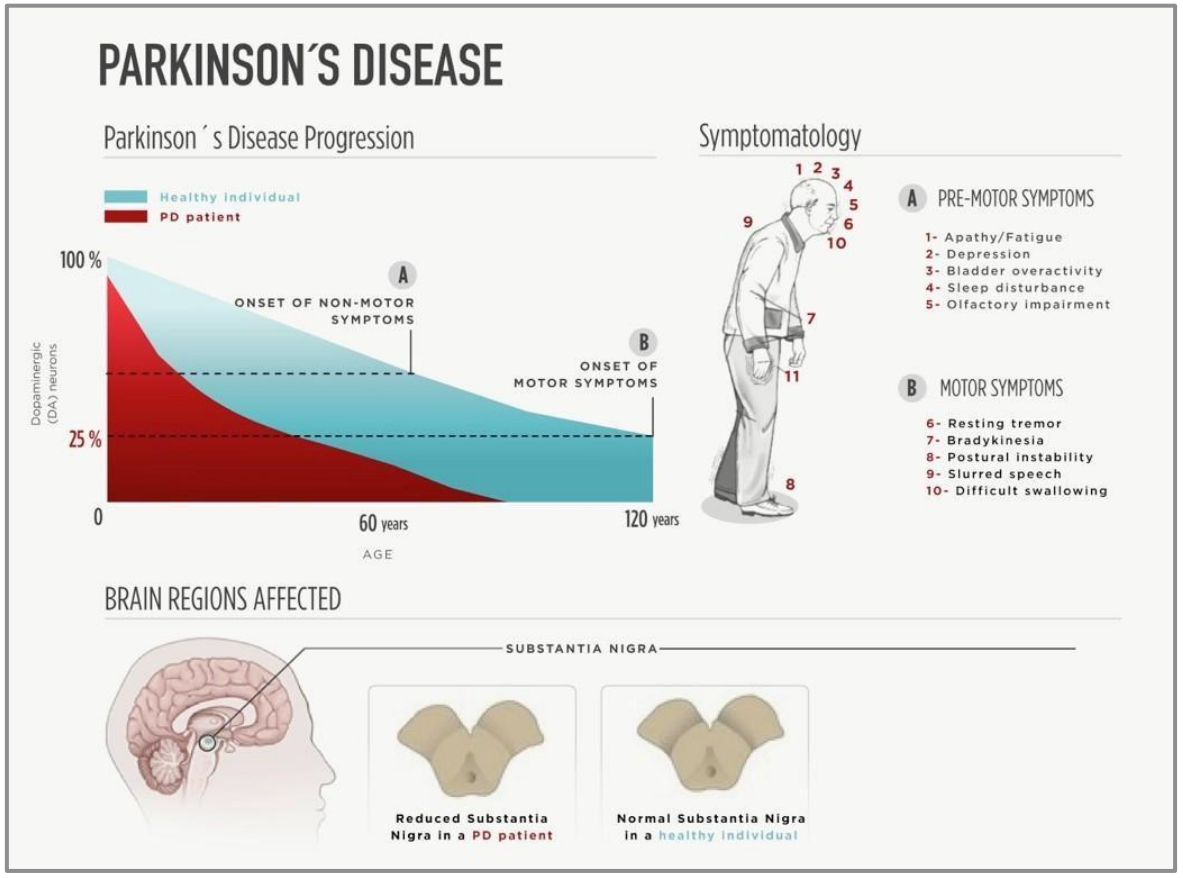
REVIEW

Intranasal Administration of Neurotoxicants in Animals: Support for the Olfactory Vector Hypothesis of Parkinson's Disease

Rui D. S. Prediger · Aderbal S. Aguiar Jr. · Filipe C. Matheus · Roger Walz · Layal Antoury · Rita Raisman-Vozari · Richard L. Doty

Received: 10 August 2011 / Revised: 20 September 2011 / Accepted: 27 September 2011

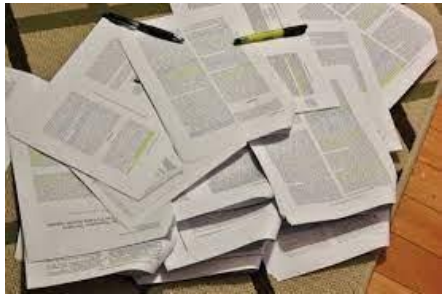
Abstract The causes of Parkinson's disease (PD) are unknown, but there is evidence that exposure to environmental agents, including a number of viruses, toxins, agricultural chemicals, dietary nutrients, and metals, is associated with its development in some cases. The presence of smell loss and the pathological involvement of the olfactory pathways in the early stages of PD are in accord with the tenants of the *olfactory vector hypothesis*. This hypothesis postulates that some forms of PD may be caused or catalyzed by environmental agents that enter the brain via the olfactory mucosa. In this article, we provide an overview of evidence implicating xenobiotics agents in the etiology of PD and review animal, mostly rodent, studies in which toxicants have been introduced into the nose in an attempt to induce behavioral or neurochemical changes similar to those seen in PD. The available data suggest that this route of exposure results in highly variable outcomes, depending upon the involved xenobiotic, exposure history, and the age and species of the animals tested. Some compounds, such as rotenone, paraquat, and 6-hydroxydopamine, have limited capacity to reach and damage the nigrostriatal dopaminergic system via the intranasal route. Others, such as 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), readily enter the brain via this route in some species and influence the function of



1. Understanding the Purpose and Impact

Some facts

A lot of complex information in life sciences and health



1.2 million articles/year (published)
3,287 new articles/day (PubMed)
Authors struggle to attract attention

Life science professionals need continued education

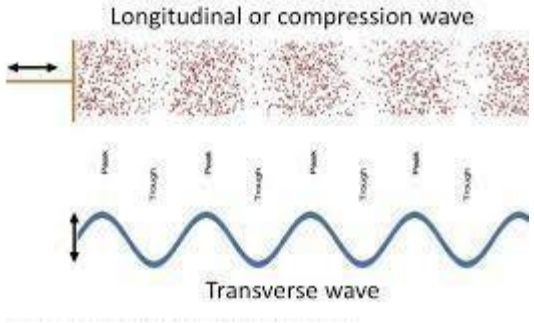
Researchers need to read
articles daily complex information to stay updated

There is too much information and too complex information

This volume will continue to exponentially rise.

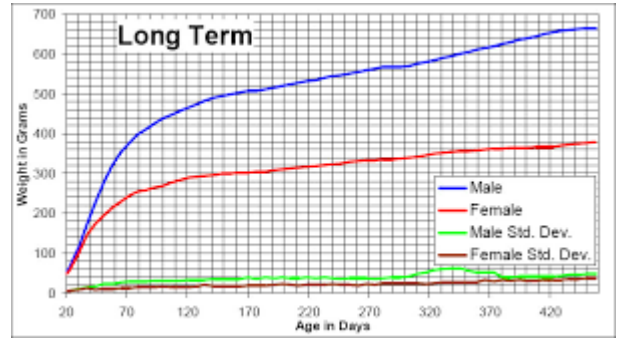
Visual representations in science: What and why?

Visual representations in science depict objects that have some kind of material or physical existence or refer to conceptual and abstract constructs.



Visual representations can be made for:

- phenomena that are not observable with the eye (i.e., microscopic or macroscopic)
- phenomena that do not exist as visual representations but can be translated as such (i.e., sound)
- experimental settings to provide visual data representations (i.e., graphs showing growth or life expectancy).



- Explaining and understanding complex phenomena
- Better clarity: instant understanding
- Accessibility/educating the public: Meaningful in all languages
- Helping solving a problem and filling gaps in our knowledge
- Facilitating knowledge building or transfer
- Displaying the beauty of science

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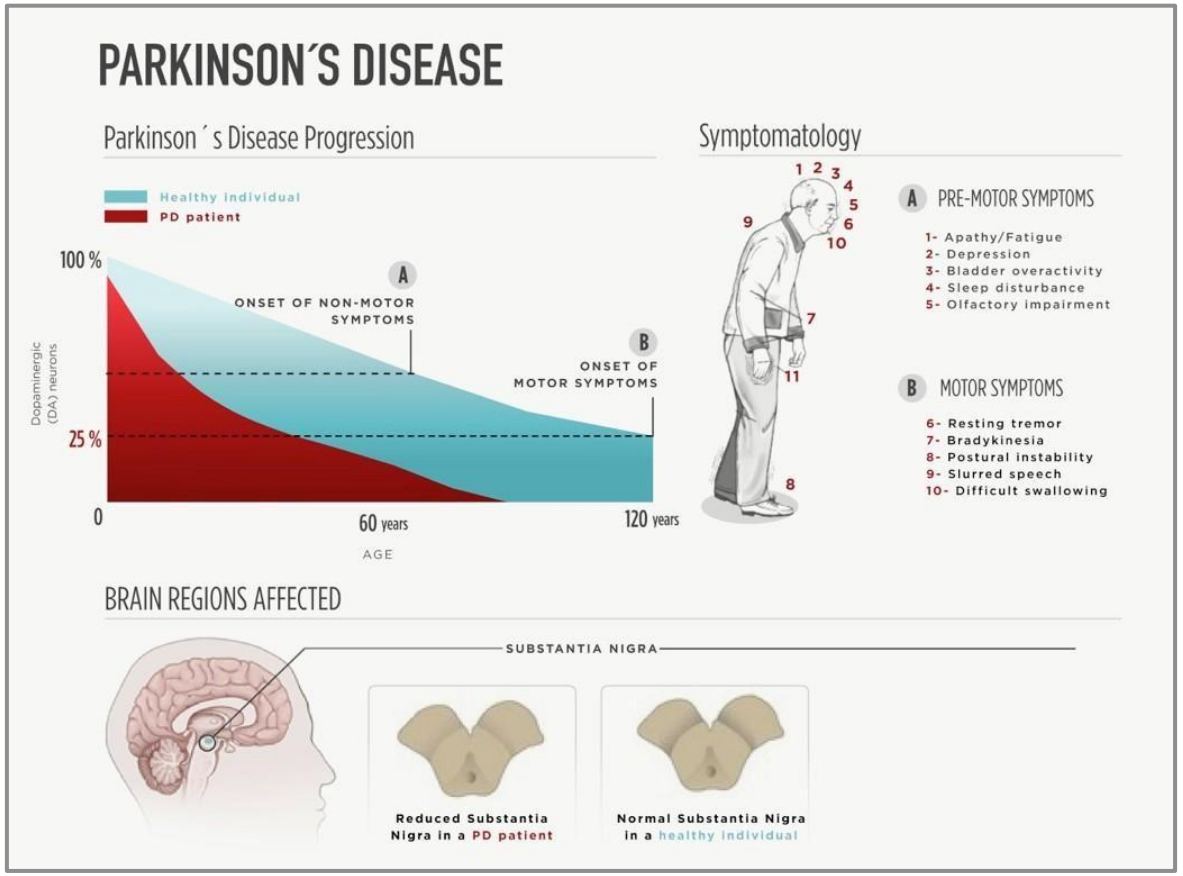
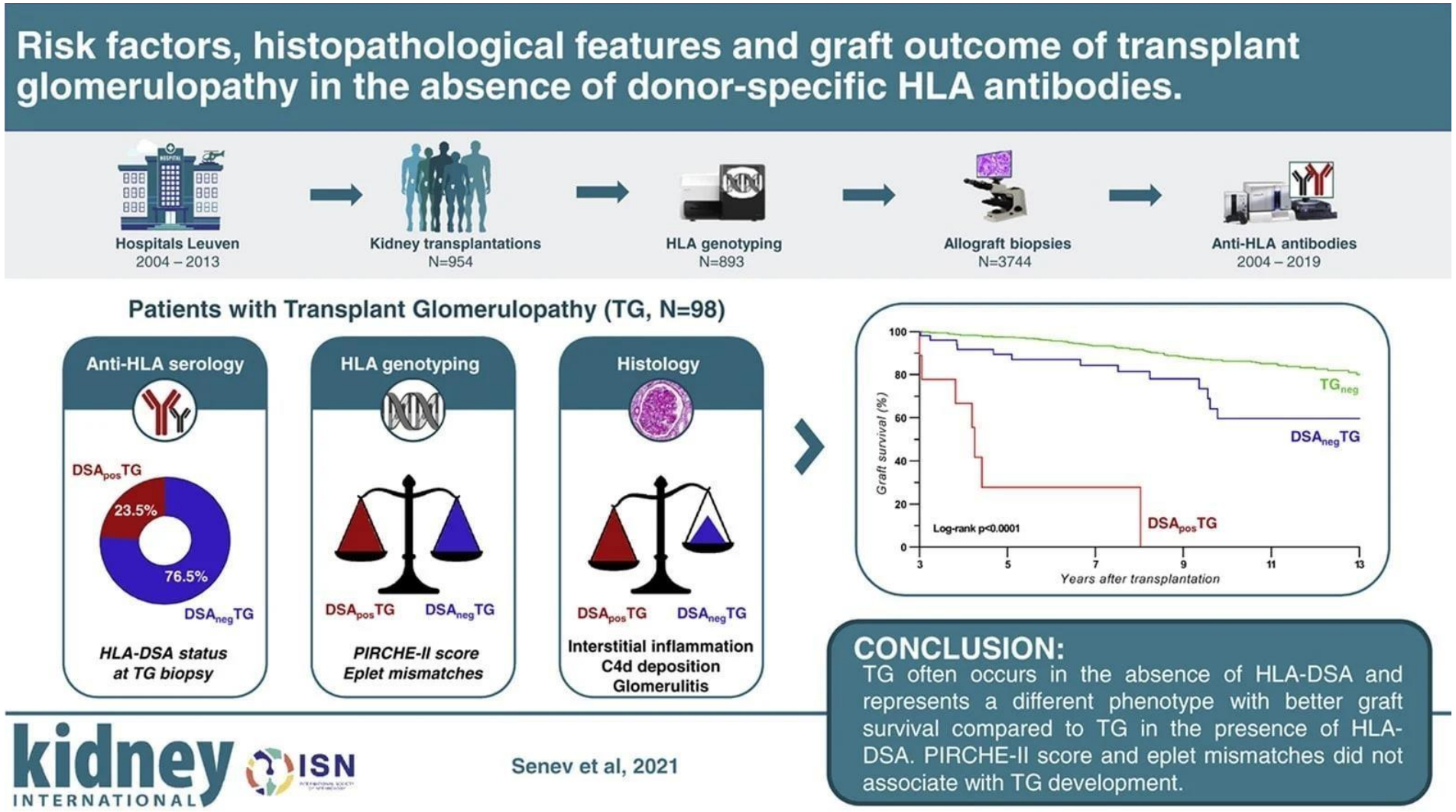


Appreciate the flow and clarity of the illustration compared to the textual abstract

Examples of graphical abstracts



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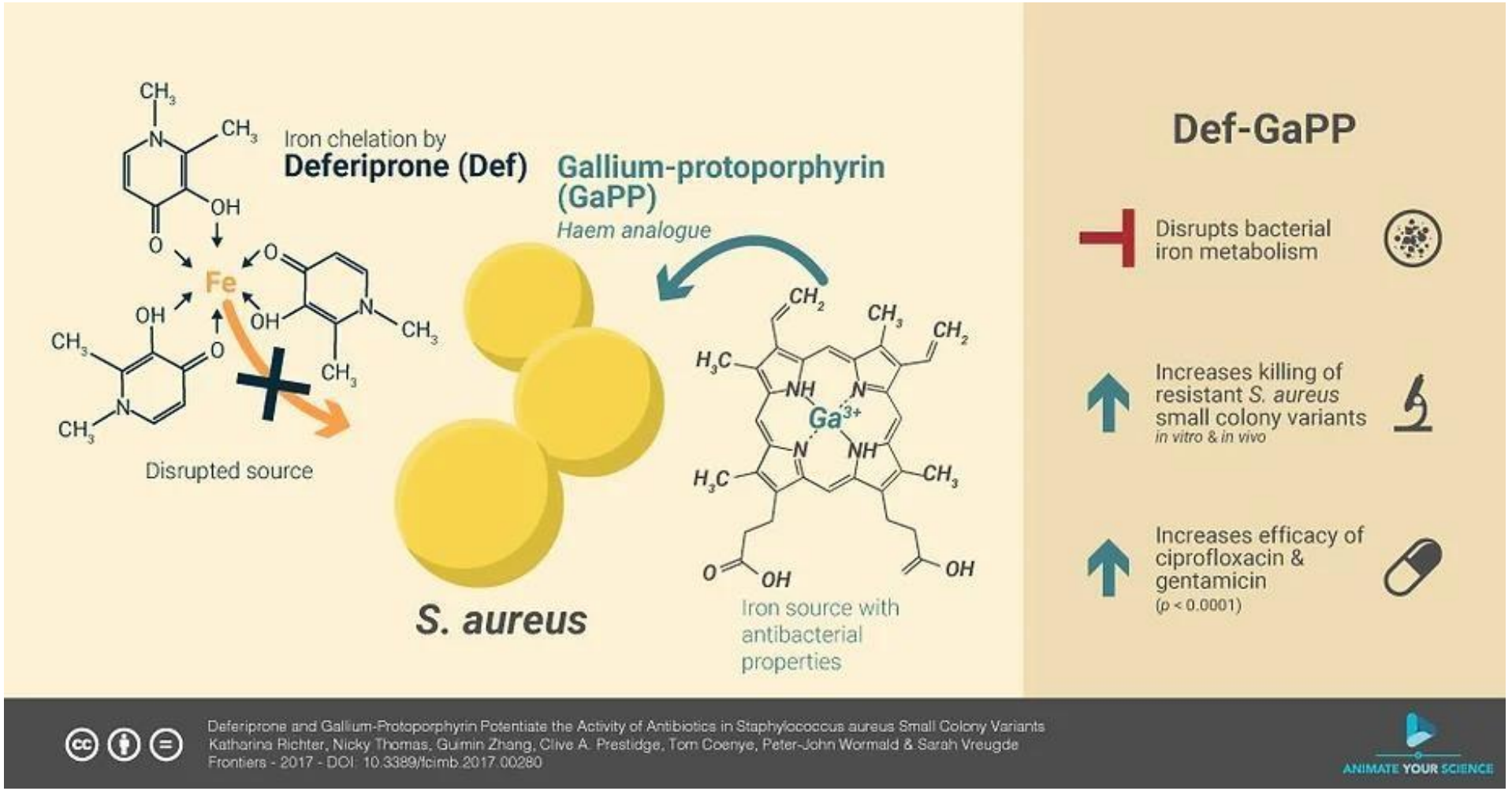

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How does sleep disturbance affect hemodialysis patients?

Kidney Medicine

Methods and Cohort

Adults on maintenance HD with OSA **(n = 36)**

Polysomnogram & Epworth Sleepiness Scale (ESS)

Interview to explore patient experience **(n = 26)**

Findings

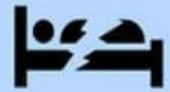
Severity of sleep apnea did not affect patients' sleep duration, sleep efficiency or ESS.

However,

70% reported broken sleep

62% felt unrefreshed upon wakening

Themes from Interview



Broken sleep

Feeling unrefreshed

Impact of poor sleep

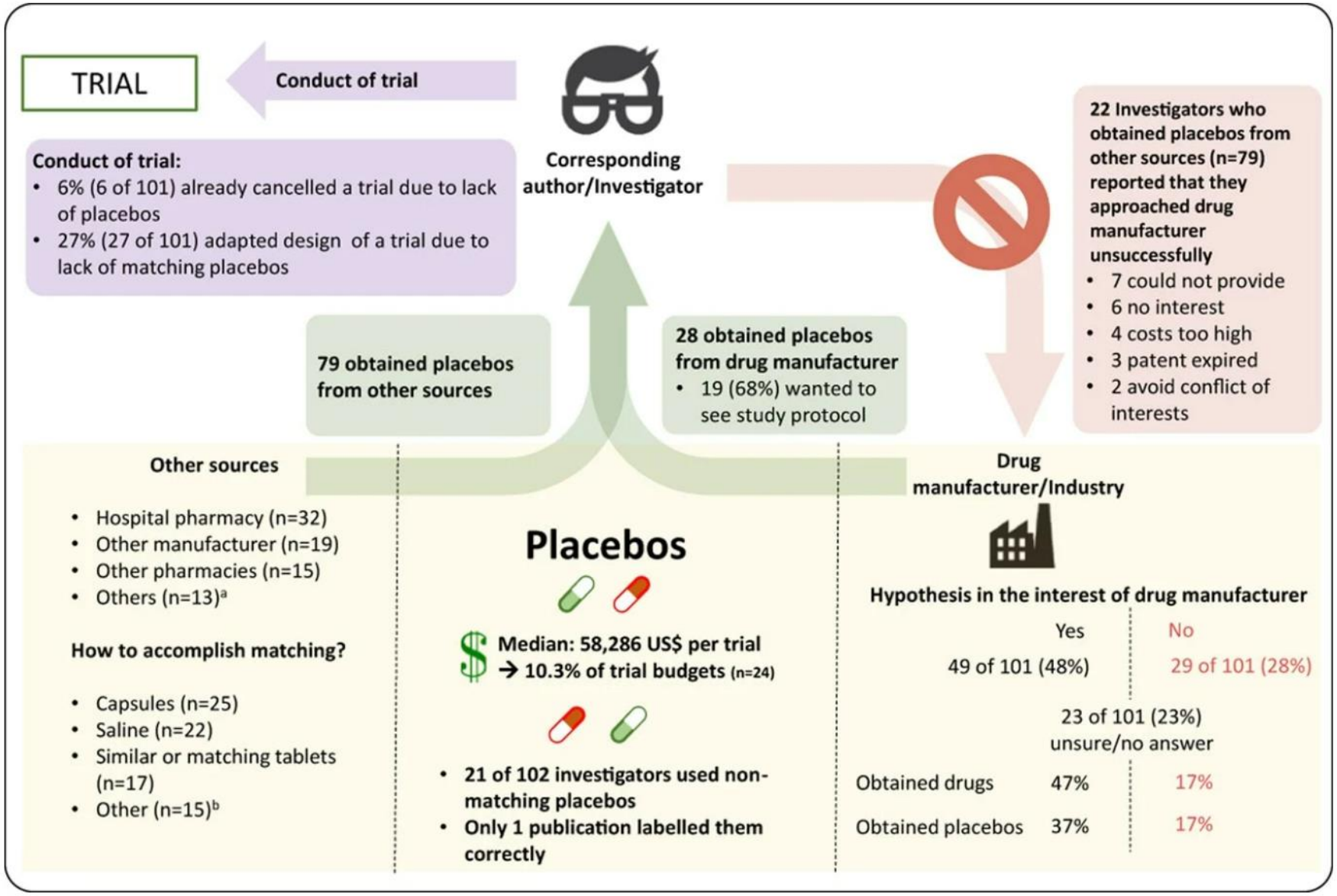
Having to "soldier on"

Conclusion: Sleep disturbance is common and has a profound impact on health and QoL of hemodialysis patients. The conflicting message between patient interview and self-reported questionnaires indicate a need for multidisciplinary approaches and improved patient communication to truly capture the health needs of individuals.

Reference: Chu G, Price E, Paech G, Choi P and McDonald V. Sleep apnea in maintenance hemodialysis: a mixed methods study. *Kidney Medicine*, 2020

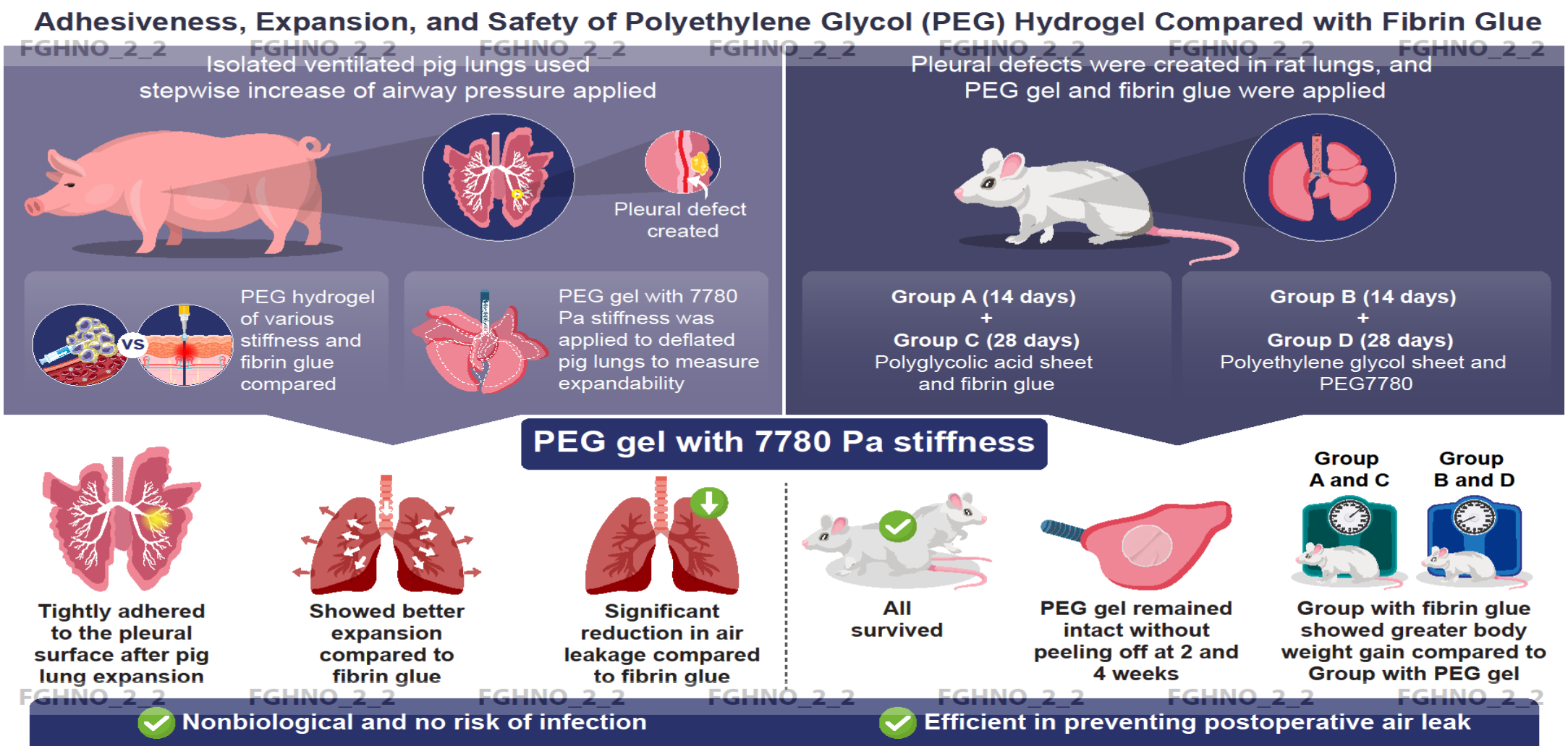
Visual Abstract by Anna R Gaddy, MD @AnnaGaddy

Sleep Apnea in Maintenance Hemodialysis: A Mixed-Methods Study ↗



A meta-research study revealed several challenges in obtaining placebos for investigator-initiated drug trials ↗

Examples of graphical abstracts *-created by Editage*



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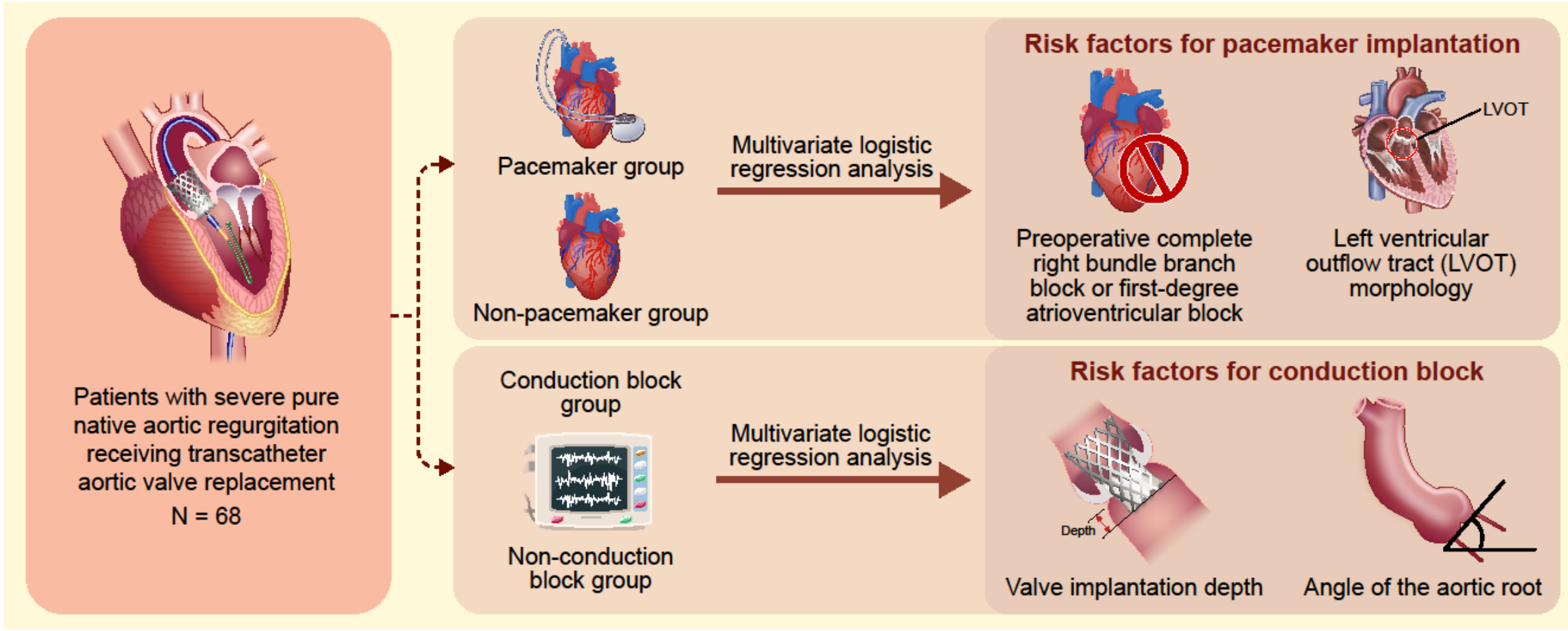

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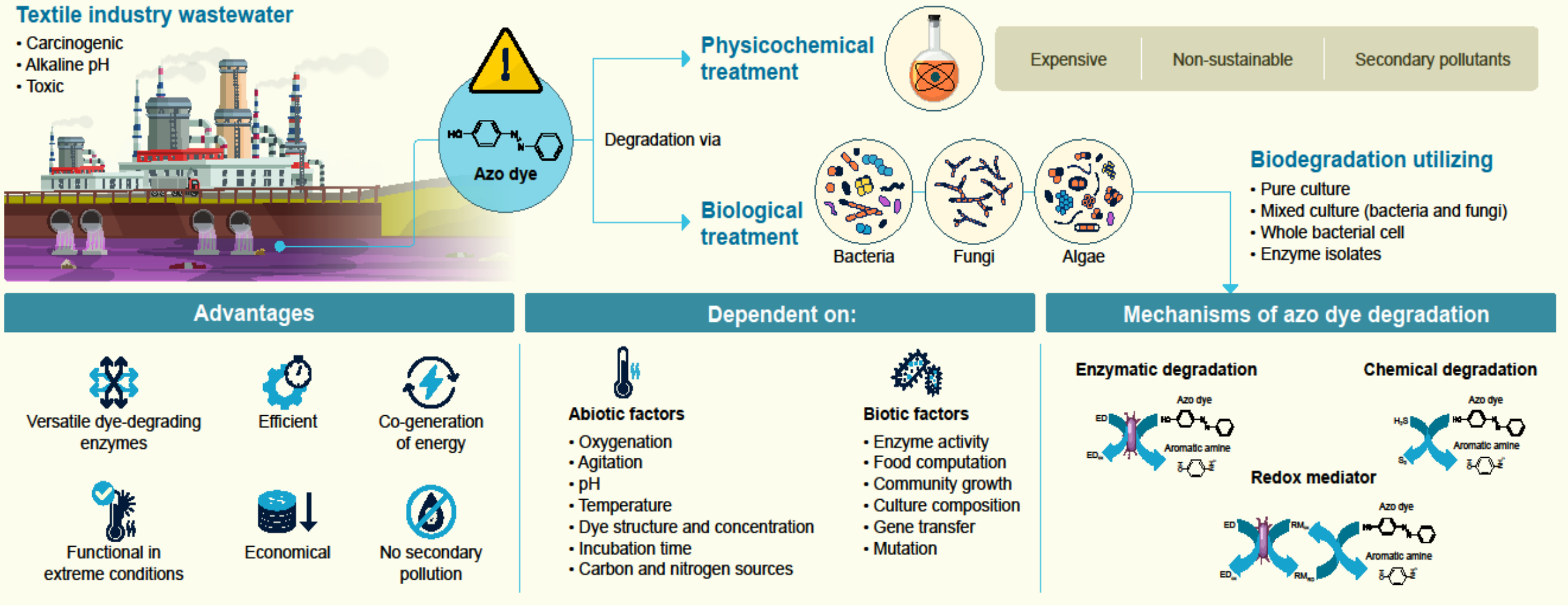
-created by Editage

Reviewing the Biological Route for the Management of Textile Industry Waste



*Editage services on the website to create graphical abstracts for your research presentations.

An effective graphical abstract will attract the attention of your reader by allowing rapid screening of the information

- A graphical abstract is **explains the message of a research paper in a clear and attractive way.**
- It **does not substitute the paper**, but rather **to attract curiosity** to it. The intention is mainly to briefly introduce the subject of the paper and summarize information.
- It's generally published together with other elements of the paper, like title, authors, and the abstract.
- The idea of the graphical abstract is to communicate together with the other elements of the scientific paper.
- Not all publishers are using graphical abstracts at the moment, but it is an initiative of Elsevier, which is followed by some important ones, like Cell and Springer.

Source: https://mindthegraph.com/blog/create-effective-graphical-abstract/

Graphical abstract

Journals are increasingly requesting the submission of a “graphical” or “visual abstract” alongside the body of the article. This is a single, concise, pictorial and visual summary of the main findings of the article. It could either be the concluding figure from the article or better still a figure that is specially designed for the purpose, which captures the content of the article for readers at a single glance. Please see examples below.

The graphical abstract will be displayed in online search result lists, the online contents list and the article on ScienceDirect, but will typically not appear in the article PDF file or print.

Spinal Cord

https://www.nature.com/documents/sc-gta.pdf

Graphical Abstracts (optional)

A graphical abstract, which summarizes the manuscript in a visual way, is designed to attract the attention of readers in the table of contents of the journal. Graphical abstracts are published in the table of contents and in the article. The graphic should be submitted as a single file using a standard file format (.tiff, .eps, .jpg, .bmp, .doc, or .pdf.), it should be 9 cm wide x 5 cm high when printed at full scale and a minimum of 300 dpi. All graphical abstracts should be submitted with a white background and imagery should fill the available width, whenever possible. Colour graphical abstracts are encouraged and will be published at no additional charge. Textual statements should be kept to a minimum.

West, C. C., Lindsay, K. J., & Hart, A. (2020). Promoting your research using infographics and visual abstracts. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, *73*(12), 2103-2105.

"Public Health England have published guidelines on how to design infographics relating to health matters which they summarize using the mnemonic G.R.A.P.H.I.C.

G – Get to know your audience
R – Restrict use of colors
A – Align elements
P – Prioritize parts
H – Highlight the heading
I – Invest in imagery (wisely)
C – Choose charts carefully "

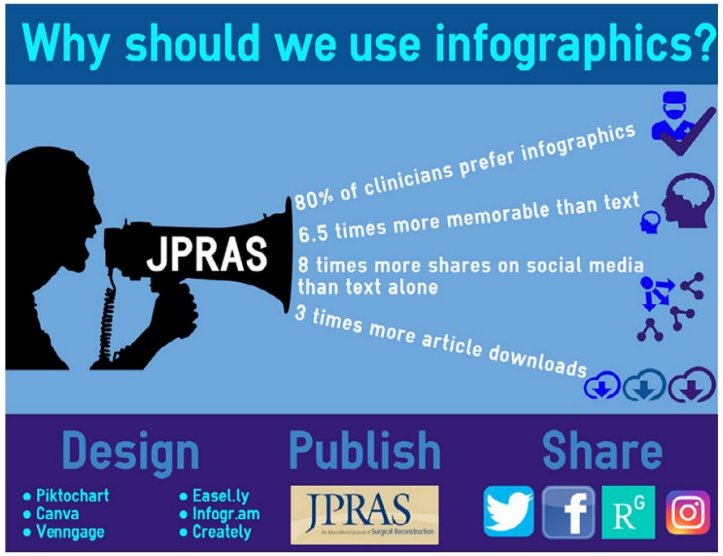


Fig. 1 Mnemonic to aid the design of health related infographics published by Public Health England.

Presenting scientific results

Graphic details

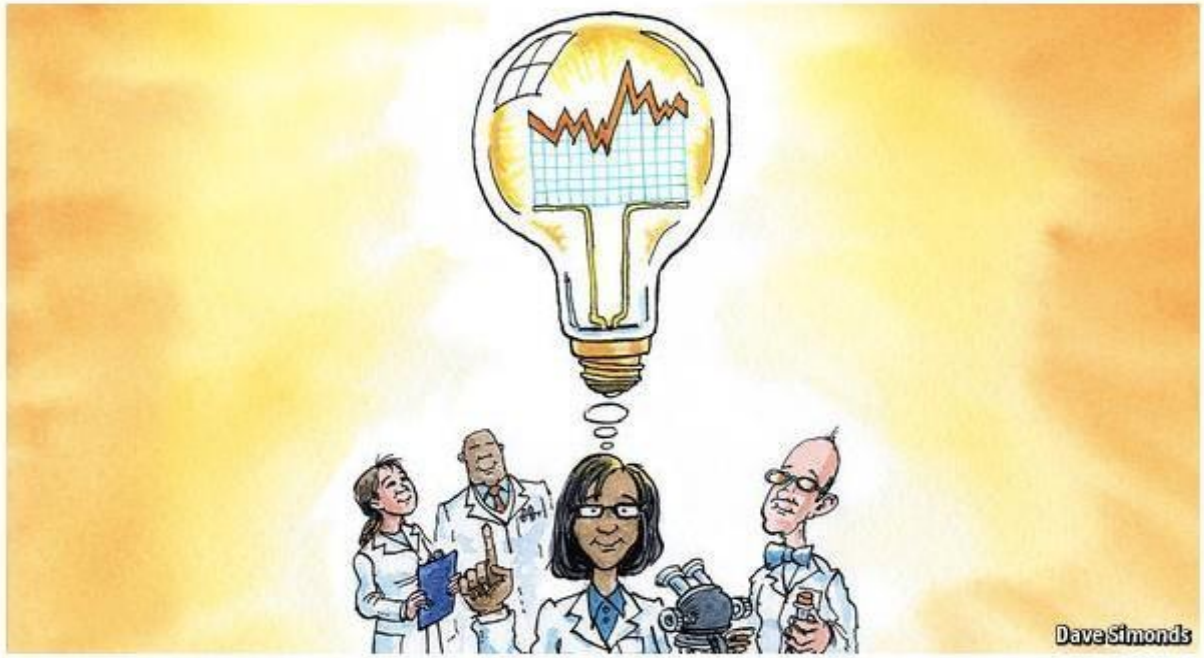
The Economist

A scientific study of the importance of diagrams to science

Jun 18th 2016 | From the print edition

Timekeeper

Tweet



A PICTURE is said to be worth a thousand words. That metaphor might be expected to pertain *a fortiori* in the case of scientific papers, where a figure can brilliantly illuminate an idea that might otherwise be baffling. Papers with figures in them should thus be easier to grasp than those without. They should therefore reach larger audiences and, in turn, be more influential simply by virtue of being more widely read. But are they? Bill Howe and his colleagues at the University of Washington, in Seattle, decided to find out.

1.63 citations
(1 image/3 pg)

+ 1 chart

60% more
citations

+ 1 infographic

120% more
citations

Did you know?

ARTICLES WITH INFOGRAPHICS HAVE:

1.5X

MORE ARTICLES DOWNLOADS

27X

MORE OFTEN CITED

1.3X

HIGHER ALTMETRIC SCORE

Did you know?

ARTICLES WITH GRAPHICAL ABSTRACT HAVE:

3X

MORE DOWNLOADS

8X

MORE SHARES ON SOCIAL MEDIA THAN TEXT ALONE

AND ALSO ARE

6.5

MORE MEMORABLE

Source: Journal of Plastic, Reconstructive and Aesthetic Surgery, 2022.

Did you know?

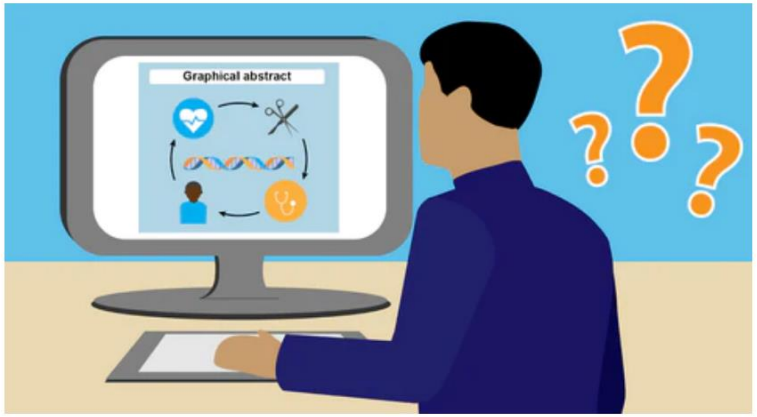
Author benefits

A graphical abstract should allow readers to quickly gain an understanding of the take-home message of the paper and is intended to encourage browsing, promote interdisciplinary scholarship, and help readers identify more quickly which papers are most relevant to their research interests.

Research has shown that articles which have graphical abstracts are beneficial both in terms of views of the article as well as increased activity on social media. In particular, the average annual use of an article is doubled when compared with those without a visual abstract.

More resources

What is a Graphical Abstract and Why Do I Need One for My Paper?



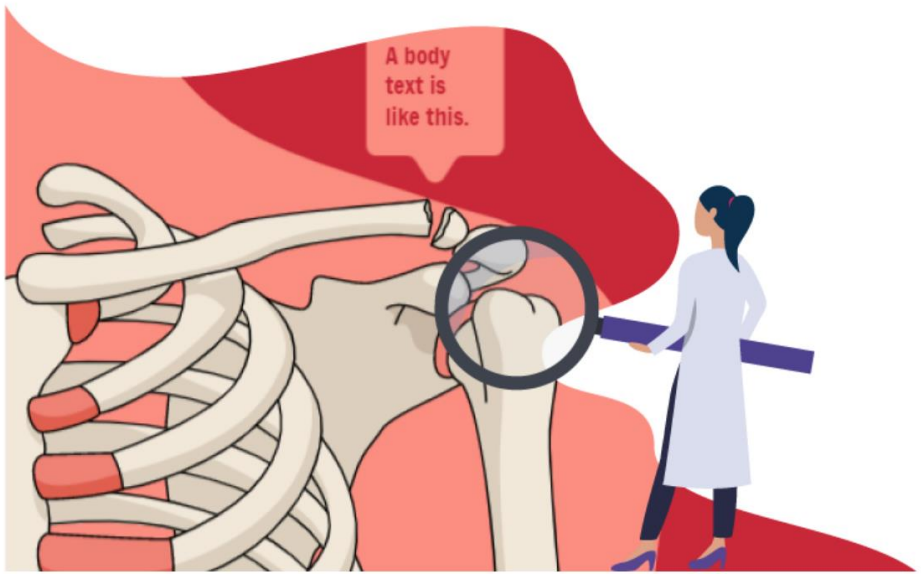
https://solutions.springernature.com/blogs/visibility/what-is-a-graphical-abstract-and-why-do-i-need-one-for-my-paper

How to create a graphical abstract for Springer

Graphical abstracts for Springer After a long time studying and working in a lab you finally got the data to publish your paper. How exciting, right? If you are in the final steps to publish a new paper you probably noticed that a graphical abstract is mandatory to publish in several scientific magazines. This includes […]

Fabiola Soares 5 min read

02/03/2020



https://mindthegraph.com/blog/graphical-abstract-for-springer/

2. Artistic Elements

Artistic elements: 4 key topics to discuss

1. Composition and Balance: Harmonious Visual Narratives

2. Color Psychology: Emotional Impact

3. Iconography and Symbolism: Depth in Simplicity

4. Typography Matters: Fonts for Clarity and Style

1. Composition and Balance: Crafting Harmonious Visual Narratives

- **Balance is Key:** Understanding how to distribute visual elements evenly across the graphical abstract enhances readability and aesthetics.
- **Focal Points:** Directing the viewer's attention strategically through the arrangement of elements creates a cohesive narrative.
- **White Space:** Utilizing negative space effectively can help declutter the composition and emphasize essential information.

2. Color Psychology: Harnessing Emotional Impact in Graphic Design

- **Emotional Resonance:** Different colors evoke specific emotions and associations, influencing how viewers interpret the graphical abstract.
- **Consistency and Contrast:** Balancing color consistency with strategic contrasts ensures readability and visual engagement.
- **Cultural Considerations**: Being mindful of cultural interpretations of color can help in creating universally accessible graphical abstracts.

3. Iconography and Symbolism: Conveying Depth in Minimalism

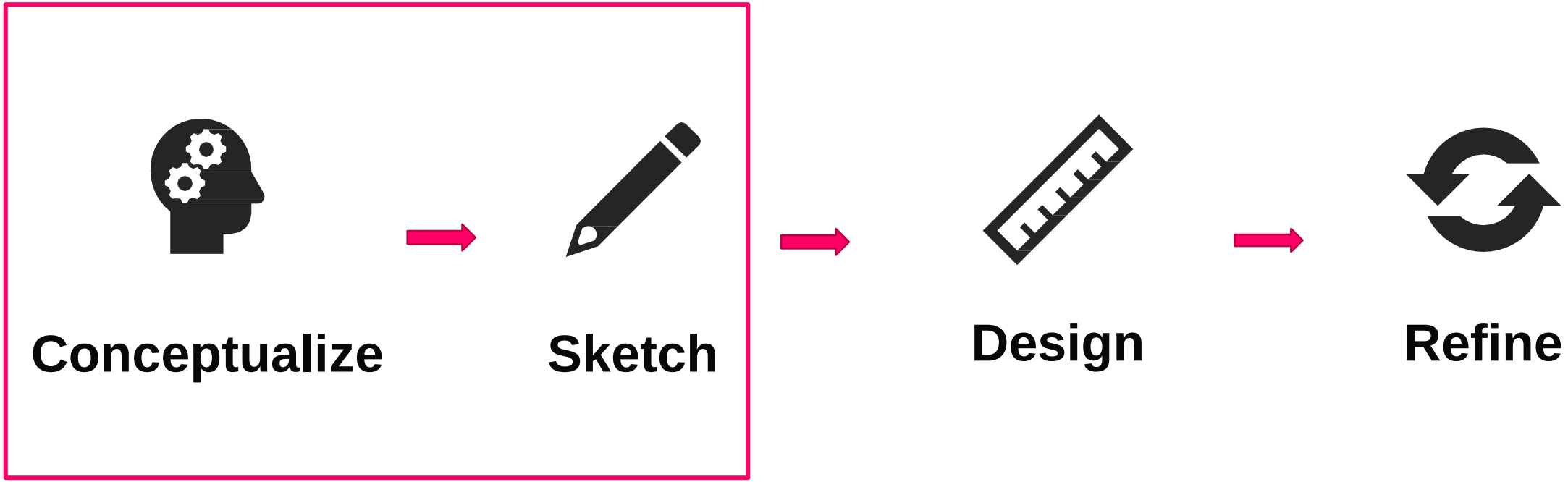
- **Symbolic Representation:** Icons and symbols can succinctly represent complex ideas, enhancing comprehension and retention.
- **Universality vs. Specificity:** Choosing symbols that are universally understood or relevant to the scientific context enhances clarity and accessibility.
- **Layers of Meaning**: Employing symbolism allows for conveying nuanced concepts and facilitating deeper engagement with the content.

4. Typography Matters: Choosing Fonts for Clarity and Style

- **Readability First:** Prioritizing legibility ensures that viewers can easily digest the textual content of the graphical abstract.
- **Font Selection:** Choosing fonts that complement the overall aesthetic while maintaining clarity and consistency is crucial.
- **Hierarchy and Emphasis:** Using font variations in size, weight, and style helps establish hierarchy and guides the viewer's attention through the information hierarchy.

3. Design Thinking

Steps to create an illustration

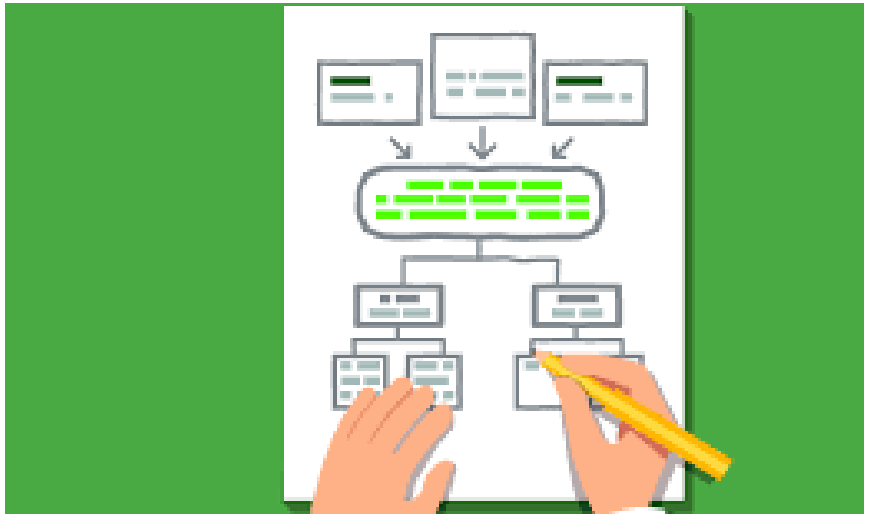


Getting started… Conceptualization

- Before starting the designing process, spend time brainstorming.
- Identify and understand the key message to get across.
- Discuss with co-authors and peers.
- Look at examples of scientific illustrations published in the target journal.
- Look at the requirements of the target journal as well

Before you even think about starting your illustration…

- Decide what to **include** and what to **exclude** based on audience and purpose of the presentation
- Shortlist the **key findings** that are relevant for the audience
- Shorten **any descriptions** to max. 8-10 words



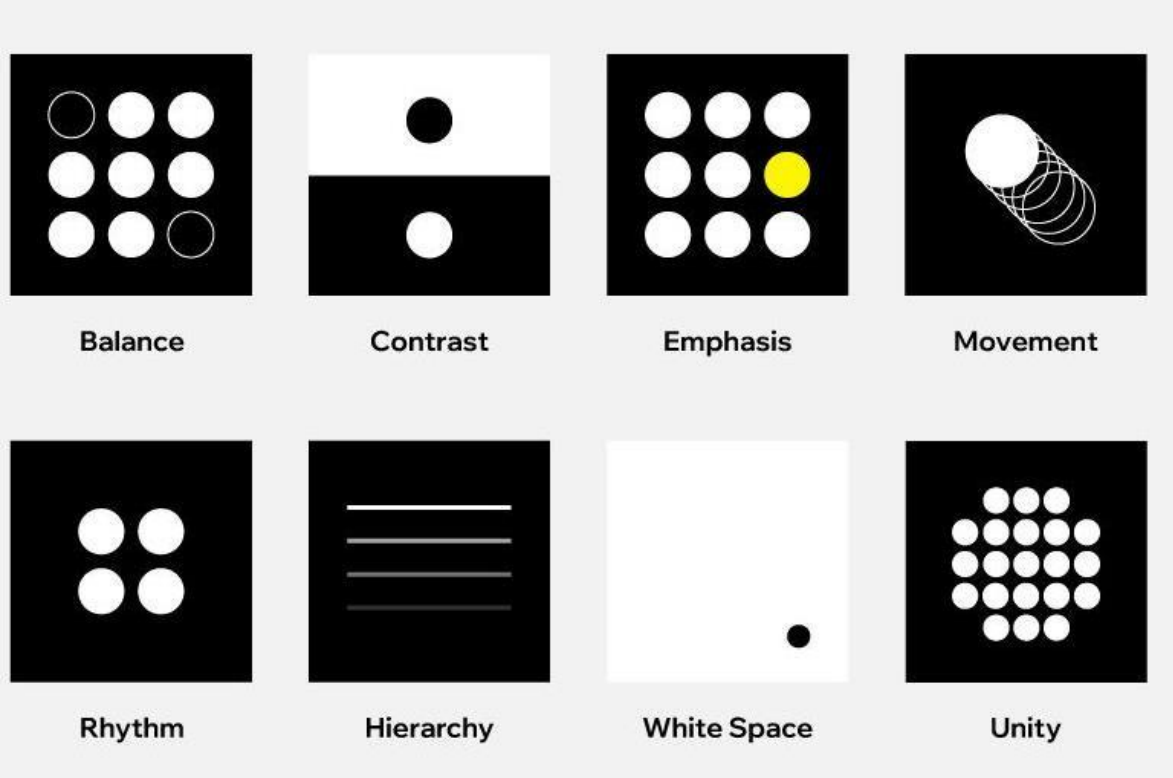
The sketching stage

- Dump all your ideas in one place
- Make mind maps and organize the ideas/concepts/information
- Doodle on paper (or digitally).
- Double-check with the target journal requirements

Design principles: Use to your advantage in conveying your message

Key guidelines:

- Structure your message so your reader will end up at the “right” conclusion
- **“Ease mental load”**
- Ensure appropriate alignment, proximity, hierarchy, repetition, balance
- White space/negative space: reduce clutter



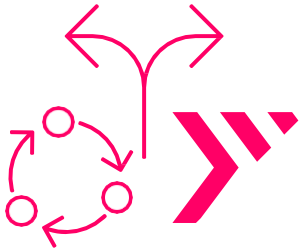
https://www.wix.com/blog/7-principles-of-design-websites

Keep in mind the direction of reading

- English text is read from left to right. If you arrange your visual items in a single horizontal row, it should read from left to right.

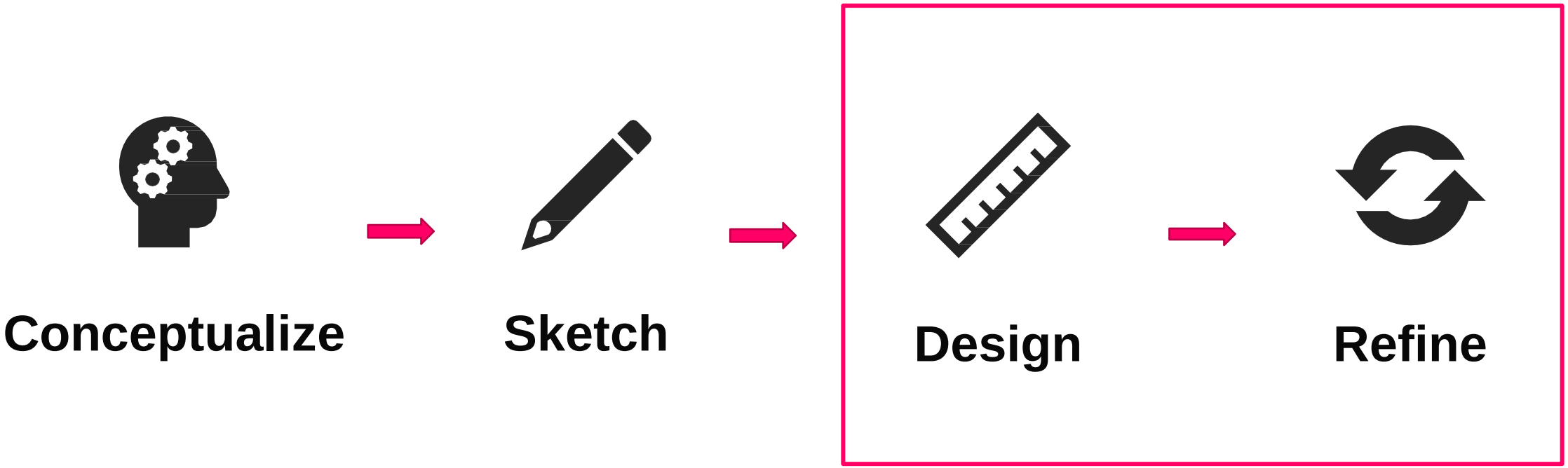
- If you arrange your visual items in a single vertical column, it should read from top to bottom.

- Use arrows to avoid ambiguity.



4. Step-by-Step Guidance

Steps to create an illustration



The designing stage

- Explore and try out various designing and artwork tools and apps

Researchers' "art" needs:

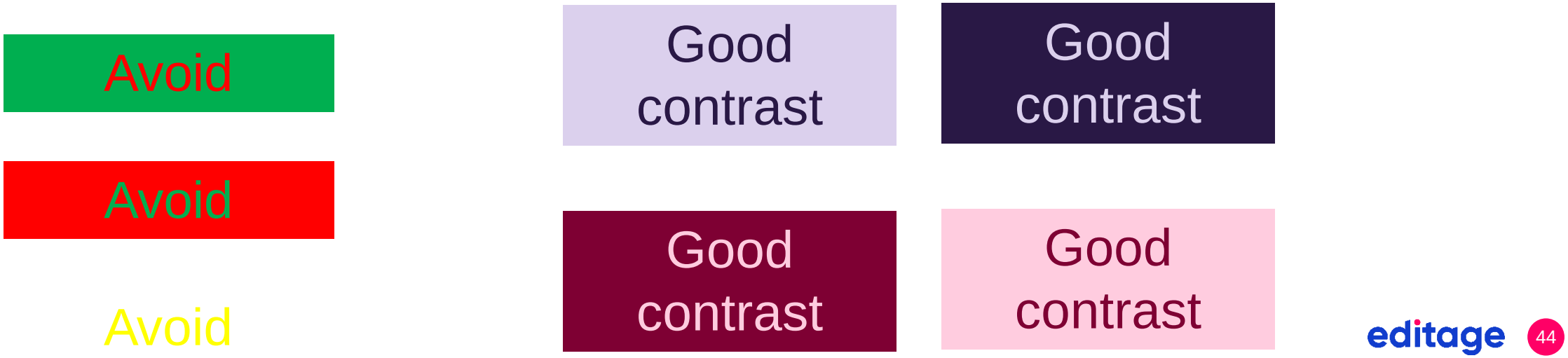
- Illustrations, schematics
- Image rendering and editing

Software tools for slide deck designing

- Microsoft PowerPoint
- Apple Keynote
- Adobe Spark
- LibreOffice Impress
- Canva
- Prezi
- Visme

Choose the right color scheme

- Thematically appropriate color scheme
- Ensure good contrast: light text on dark background or dark text on light background
- Avoid combinations of red and green as colorblind (CVD) people may not be able to read it
- Use contrasting colors to highlight important information or to group related information together.



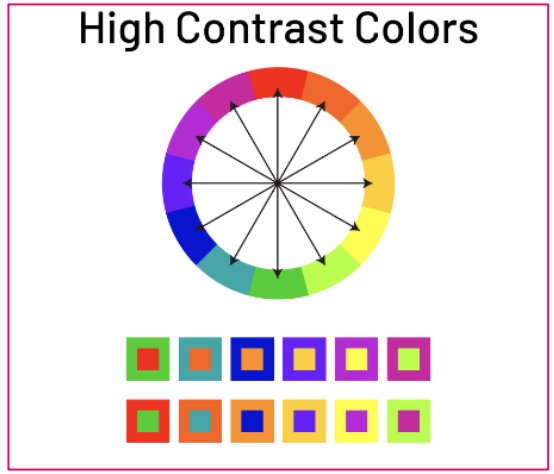
- For scientific purposes, using a carefully selected color palette can help you tell your scientific story well.
- Examples:

  blue and red on a heat map: hot (increase) and cold

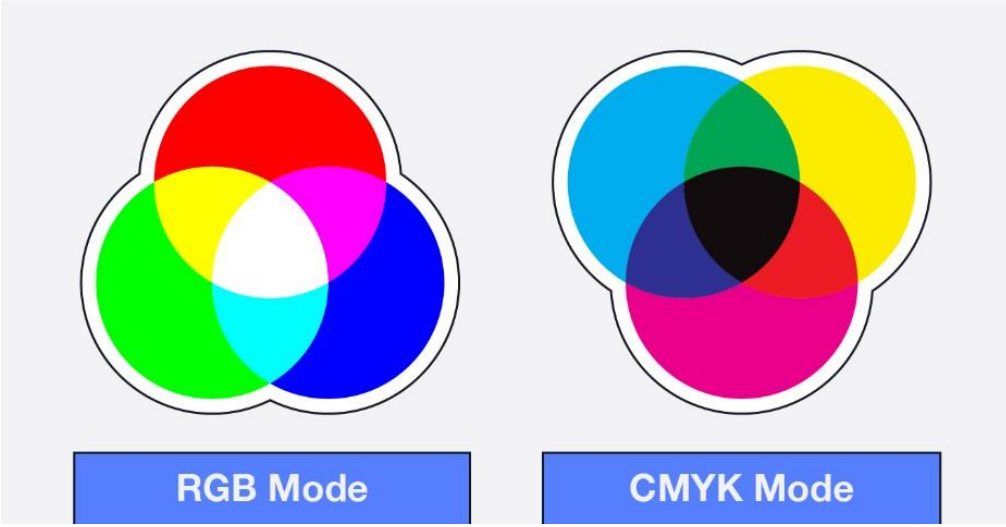
  (decrease) green and brown on a map: rainfall/aridity

- Use an accessible color palette that doesn’t confuse people with color vision deficiency (color blindness)

- Choose opposing colors on the color wheel for better impact.



- RGB: digital designs
- CMYK: print designs, e.g., posters
- (check journal requirements before starting)



Source: https://www.g2.com/articles/color-co

- To create contrast or to make sure to bring across similarities, you can use different shades of the same primary color.
- Adjust hue, saturation, and lightness to create an effective scientific color palette using any colors that best represents your dataset.

Source: https://www.virtualartacademy.com/three-components-of-color/

Choose the right font

- Consider size and accessibility to all readers
- Serif fonts have decorative strokes, whereas sans serif fonts are without any decorative strokes
- Serif fonts are traditional, formal, and elegant (but can feel outdated, less modern, not commonly used in business)
- Serif fonts potentially suitable for scientific content that involves equations or alphanumeric combinations
- Never use fancy fonts in scientific presentations

Illustrate I10

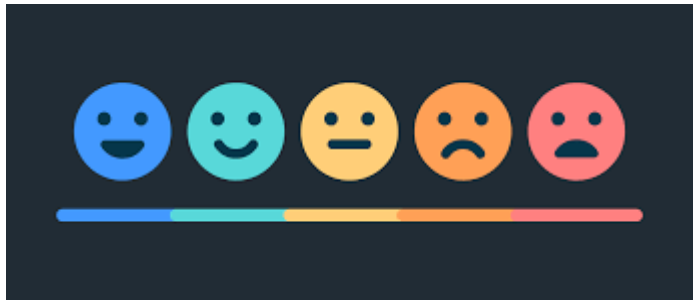
Illustrate I10

Use icons and images wisely

- Images/icons should be relevant, **consistent**, interesting, **informative**, and eye-catching
- Use **images** and **symbols** that represent complex ideas in a simple and easy-to-understand way
- They should complement your data and your message
- Avoid using icons and images that are too complex, too generic, or too decorative, and that interfere with your data or your story.

The refining stage

- Seek feedback and inputs from peers/supervisor.
- Keep revising the abstract till it is clear and appealing.
- Revisit the journal’s guidelines and ensure that the final graphical abstract adheres to them.



Why do researchers need a helping hand?

So far, we talked about how a researcher can create illustrations themselves.

But there are some pain points:

- Non-uniform figure styles
- Not finding EXACTLY what they need (relying only on PowerPoint or limited stock images)
- Spending too much time working on illustrations
- Unsatisfied with the visual impact

But there are SO many options available today!

Points to consider when using scientific illustration creation services

- **Expertise and specialization:** Choose a service with expertise in the specific field or subject matter relevant to your research.
- **Portfolio**: Review sample work to gauge their style, accuracy, and overall quality.
- **Copyright and usage rights:** Clarify usage rights associated with the illustrations.
- **Turnaround time:** Ensure the service provider can meet your timeline without compromising on quality.
- **Technology:** Ensure that the service provider uses up-to-date technology and tools. Consider whether the illustrations are suitable for print, digital platforms, or presentations.
- **Data safety:** Ensure the service provider has protocols in place to maintain confidentiality and data security.
- **Reviews:** Look for testimonials or case studies that demonstrate the service provider's ability to meet the needs of scientific projects.

5. Summary

Summary

- **Purpose and Impact:** Graphical abstracts are starting to play a fundamental role with high importance in scientific communication
- **Artistic Elements:** To capture attention, consider Composition and Balance, Color Psychology, Iconography and Symbolism, and Typography
- **Design Thinking:** Strategically structure and present to guide the attention and make the key takeaway topics stand out
- **Step-by-Step Guidance:** Use practical guidance and tips and tools to design a great graphical abstract, and consider when to bring in professionals to support you

* Further reading

- Essential soft skills you need to build as a research leader. https://www.editage.com/insights/essential-soft-skills-you-need-to-build-as-a-research-leader?refer- type=article)
- Get Visual, Get Visible: Part 1- How 7 Publishers Are Introducing Multimedia In Journal Workflows. https://impact.science/blog/get-visual-get-visible-part-1-how-7-publishers-are-introducing-multimedia-in-journal-workflows/
- Get Visual, Get Visible: Part 2- Content Workflows And Prominent Innovations. https://impact.science/blog/get-visual-get-visible-part-2-content-workflows-and-prominent-innovations/

* An app for creating slides, figures, layouts: Canva

- Graphical representation of research to depict results/summarize your research for sharing and promotion, help readers visually understand complex data and detail.
- Create posters and banners of custom dimensions using different design elements.
- Use templates, layouts, grids
- **Collaborative**: can invite team members/PI to edit in real time
- Image editing tools, design elements

- ✓ **Noun Project, Biorender:** Image repositories with clipart and icons
- ✓ **Inkscape, Vectr:** For creating drawings

*Apps for images, icons and artwork

- Autodraw: Draw shapes, and the software will suggest objects that they resemble and provide illustrations
- Sci Draw: A repository of drawings of scientific objects such as cells and animals, uploaded by scientists. Users can download the images and use them for free

* Free visuals (icons, stock photos)

- @pixabay for stock photos, vectors, and videos https://pixabay.com
- @unsplash for high-resolution photos https://unsplash.com
- @pexels for free stock photos and videos https://pexels.com
- @burstphotos_ for photos burst.shopify.com

* Free visuals (icons, stock photos)

- @pictography for free photos picography.co
- https://needpix.com for photos
- @unDraw_co for SVG images that you can use completely free and without attribution https://undraw.co
- @freepik images with simple attribution https://freepik.com
- @PhyloPic for silhouette images of animals, plants, etc. phylopic.org

Thank you

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