W.I.M.S.

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WOMEN IN MEDICINE AND SCIENCE

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GET OUT THERE!

HOW TO WRITE A REVIEW ARTICLE

W.I.M.S. JUNE SESSION

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Overarching Goal: To promote research and scholarly activity for our faculty members both on and off campus.

Upcoming WIMS RCC Events

- **June 2023:** How to write a review article (Anna Eiring PhD)

- **August 2023:** Meta-analyses and systematic review articles (Alok Dwivedi PhD)

- **Fall 2023:** Case reports and medical education scholarship (TBD)

- **Spring 2024:** Writing successful NIH grant applications (TBD)

Today's Learning Objectives

1. Understand the purpose of writing review articles.

2. Understand the format and steps to writing a review article.

3. Tips to write more clearly and concisely.

Attendees will learn what it takes to write a review article, how it is different from a scientific article, the benefits of writing review articles, and best practices for successful completion.

What is the purpose of a review article?

- A review article is a **critical evaluation** of the data available from **existing studies** on a particular topic.

- A good review article provides readers with an in-depth **understanding** of a field, but also highlights key **gaps** and **challenges** to address in the future.

- Sometimes, a review article can draw **new conclusions** from the existing data.

Types of Review Articles

- **Historical review:** Traces the development of an area of science by assessing the chronological order of studies, with a focus on patterns.

- **Narrative review:** Describe the primary data without using an integrated, meta-analysis approach to examine the results of various studies.

These types of reviews are geared towards a more general audience

Types of Review Articles

- **Systematic review:** May or may not use meta-analysis and are focused on systematically analyzing studies related to a topic/question, with particular attention to methodologies.

- **Meta-analysis:** The synthesis of previous quantitative studies that involves statistical approaches to aggregate effect size across studies to determine patterns.

- **Umbrella review:** Summarizes findings of previous reviews.

- **Scoping review:** A preliminary assessment of the potential size and scope of available research literature, with the aim to identify the nature and extent of available research evidence.

Types of Review Articles

These types of reviews are geared towards more specialized audiences and journals

Review Article Structure

Table 1. Core components of a typical review article.

Name of section	Typical number of words	Aims, content and format
Title	7–12 words	Should succinctly describe the scope of the review in a clear, accessible and engaging way. The title should be a single, standalone sentence that might be separated into two parts with a colon or hyphen. Abbreviations should be avoided in titles unless they are very common and don't need defining e.g. DNA.
Abstract	150–200 words	Briefly outlines the background of the topic and highlights what makes it timely and worth reviewing, and summarises the specific goals or key messages of the review. The Abstract of a review article is typically structured as a single paragraph and doesn't include references. Abbreviations and heavy jargon should be kept to a minimum, but do include keywords that will optimise searchability.
Introduction	300–500 words	Provides more detailed background/contextual information to introduce the topic, including a basic description of key themes, terms and processes that will aid understanding of the rest of the article. The Introduction should also define the aims and scope of the article and briefly outline which subtopics will be discussed. This section should be written as continuous prose and should be supported with references, and figures (or other display items) if appropriate. Specific research findings would not usually be discussed in significant depth in the Introduction.

Review Article Structure

Table 1. Core components of a typical review article.

Name of section	Typical number of words	Aims, content and format
Main text	3500–5000 words	The central part of the review, which is usually divided into several subsections with appropriate topic-specific headings, should provide a detailed discussion of research findings relevant to the overall topic, with an adequate description of the methodologies, results and conclusions of individual research papers. Related research papers should be discussed together/under the same subheading, and these links should be made clear to readers to form a coherent narrative. Throughout, the significance of research findings in the broader context of the research topic being reviewed should be highlighted, and the author should aim to critically appraise the strengths and weaknesses of individual papers rather than just laying out facts. All subsections should be independently introduced and concluded, and the text should be fully supported with references. Care should be taken to cite the original article reporting a specific finding and the overall discussion should be balanced. Figures, tables and other display items should be used to aid understanding and break up long sections of text.
Conclusions	350–500 words	Rounds up the article by providing a summary of central themes and take-home messages. Can also provide the author's perspectives on future research in the field, key challenges and outstanding questions. Usually written as continuous prose but a bulleted list could be used to emphasise key points. Supporting references might be included.

Review Article Structure

Table 1. Core components of a typical review article.

Name of section	Typical number of words	Aims, content and format
References/ bibliography	No word limits but a typical review article has 150–200 references	This section lists all references cited in the review article text or its figures and tables. The references should be formatted according to journal style guidelines.

Dhillon P. *FEBS J* 2022.

What are the benefits of writing a review article?

- Publishing helps to **establish yourself** in the field.

- Review articles are a great way to solidify a **new collaboration** and demonstrate your ability to **work together**.

- Helps to expand the writer's **knowledge** of their specialist area and develop their **analytical** and **communication skills**.

- Granting agencies often won't fund investigators unless they are **actively publishing**.

What are the benefits of writing a review article?

Eiring Lab Funded Grants and Published Manuscripts

- ■ Grants Funded
- ■ Papers Published
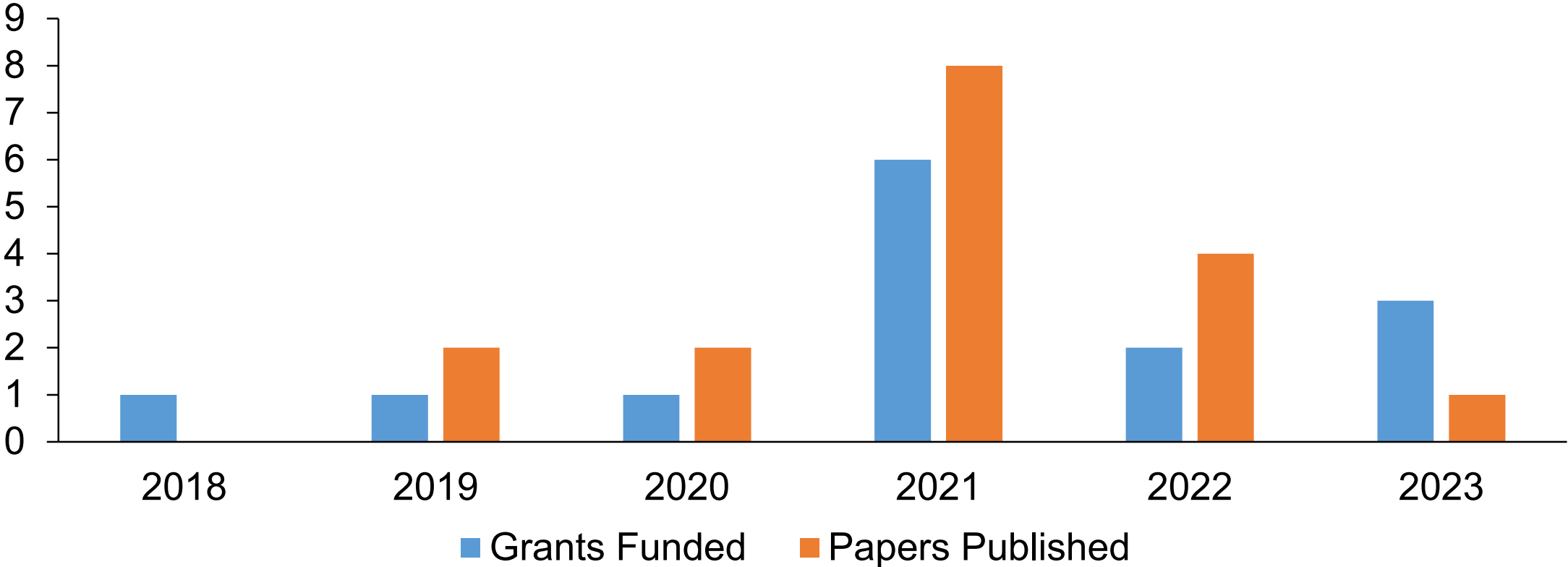
10 Simple Rules for Writing a Literature Review

1. Define the topic and audience
2. Search and re-search the literature
3. Take notes while reading
4. Choose the type of review you wish to write
5. Keep the review focused, but make it of broad interest
6. Be critical and consistent
7. Find a logical structure
8. Make use of feedback
9. Include your own relevant research, but be objective
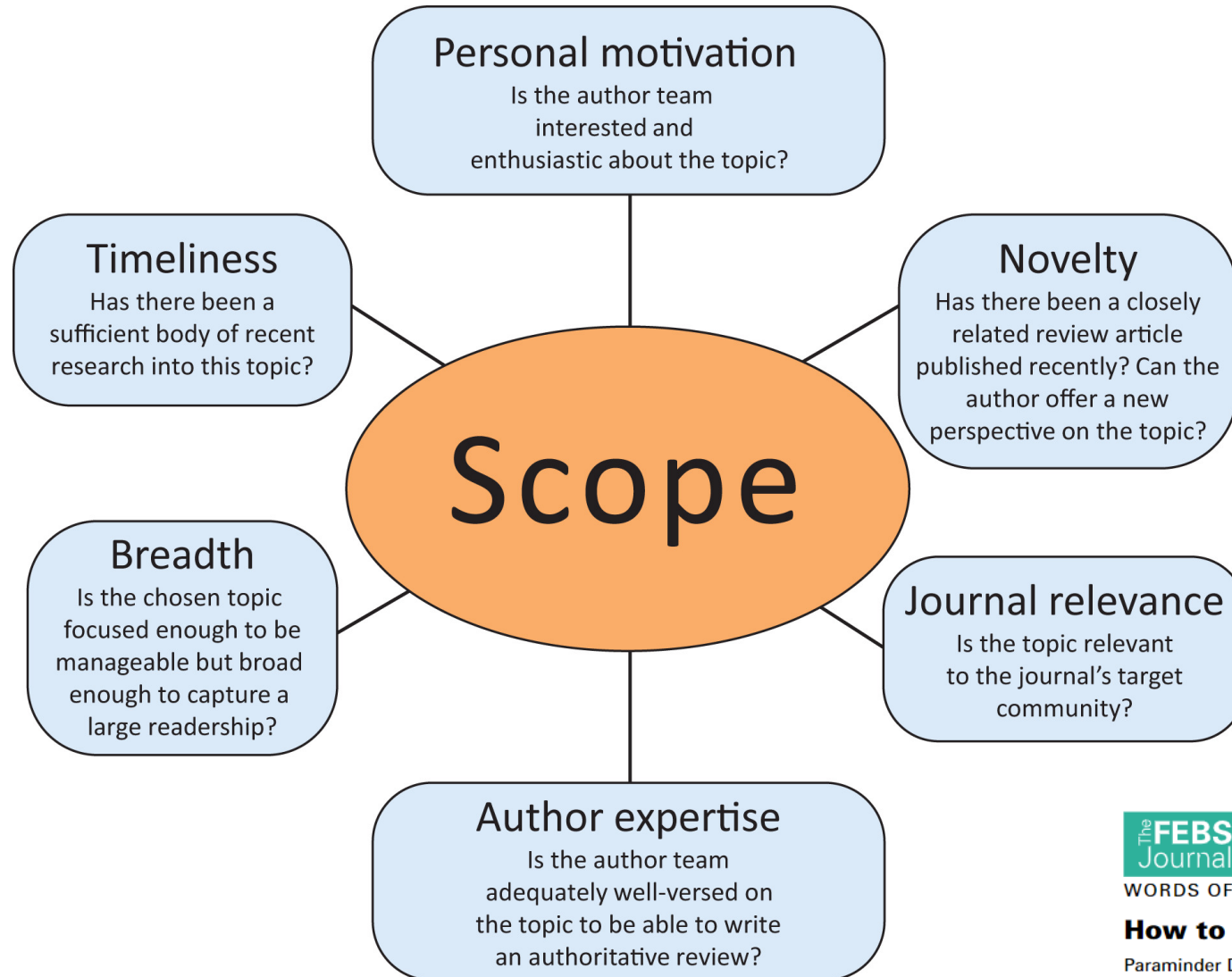10. Be up-to-date, but do not forget older studies

Writing a Review Article Takes Time

- Give yourself plenty of time to write a scientific review article.

- **START EARLY!!!**

- Spend time reading the literature and write down your thoughts as you proceed.

- Stay on time and submit your review article by the deadline.

Deciding the Topic

- Before you begin, decide on the topic and **make an outline**.

- A common problem for people writing their first review article is being overly ambitious!!

- Avoid digressing and including all of the information in the field.

- **Be focused** and **avoid jargon**!

- Too much information is confusing for the readers. Be pointed and concise on the topic at hand.

Deciding the Topic

Personal motivation
Is the author team interested and enthusiastic about the topic?

Timeliness
Has there been a sufficient body of recent research into this topic?

Novelty
Has there been a closely related review article published recently? Can the author offer a new perspective on the topic?

Scope

Breadth
Is the chosen topic focused enough to be manageable but broad enough to capture a large readership?

Journal relevance
Is the topic relevant to the journal's target community?

Author expertise
Is the author team adequately well-versed on the topic to be able to write an authoritative review?
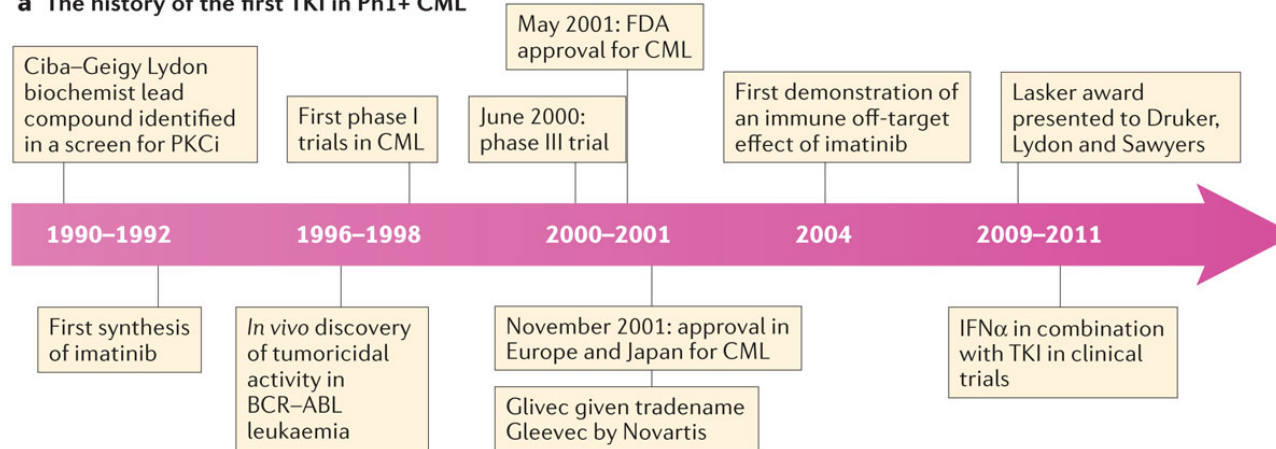
Be Well Versed with the Literature

- Learn about the **initial** studies in the field and also the **latest** studies.

- A good review summarizes relevant **discoveries**, discusses their **implications**, and speculates on the **future** of the field.

- Make notes while reading the literature.

- Discuss both the significant **findings** and the **caveats**, and how those caveats can be addressed in the future.
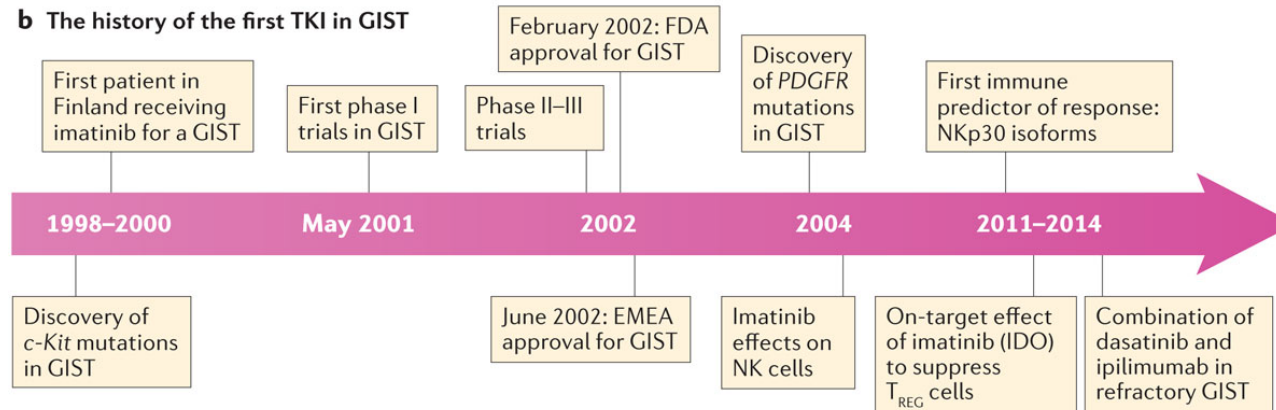
Utilize Graphics

- Include charts or figures to depict **key points** of the review.

- Many review articles include a **timeline** that details significant discoveries that contributed to the field.

Utilize Graphics

a The history of the first TKI in Ph1+ CML

Ciba–Geigy Lydon biochemist lead compound identified in a screen for PKCi

First phase I trials in CML

May 2001: FDA approval for CML

June 2000: phase III trial

First demonstration of an immune off-target effect of imatinib

Lasker award presented to Druker, Lydon and Sawyers

1990–1992   1996–1998   2000–2001   2004   2009–2011

First synthesis of imatinib

In vivo discovery of tumoricidal activity in BCR–ABL leukaemia

November 2001: approval in Europe and Japan for CML

Glivec given tradename Gleevec by Novartis

IFNα in combination with TKI in clinical trials

b The history of the first TKI in GIST

First patient in Finland receiving imatinib for a GIST

First phase I trials in GIST

February 2002: FDA approval for GIST

Phase II–III trials

Discovery of *PDGFR* mutations in GIST

First immune predictor of response: NKp30 isoforms

1998–2000   May 2001   2002   2004   2011–2014

Discovery of *c-Kit* mutations in GIST

June 2002: EMEA approval for GIST

Imatinib effects on NK cells

On-target effect of imatinib (IDO) to suppress T_{REG} cells

Combination of dasatinib and ipilimumab in refractory GIST

Nature Reviews | Clinical Oncology

Kroemer, G. *et al.* (2016) Immunological off-target effects of imatinib
Nat. Rev. Clin. Oncol. doi:10.1038/nrclinonc.2016.41

Utilize Graphics

- Include charts or figures to depict **key points** of the review.

- Many review articles include a **timeline** that details significant discoveries that contributed to the field.

- Graphics software that are useful include **PowerPoint**, **Adobe Photoshop**, and **Adobe Illustrator**.
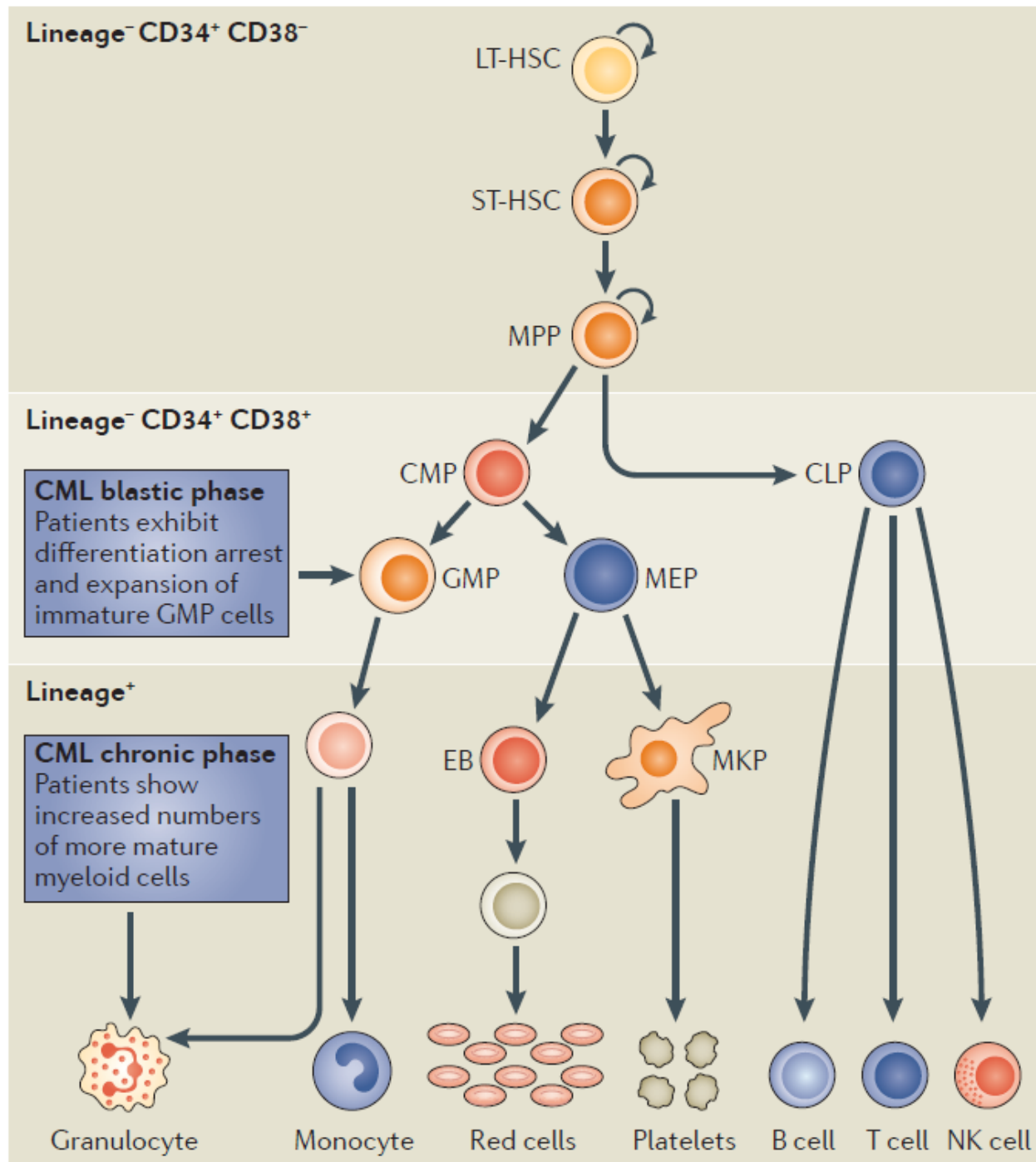
- Online tools include **BioRender** and **Canva**.

REVIEWS

Pushing the limits of targeted therapy in chronic myeloid leukaemia

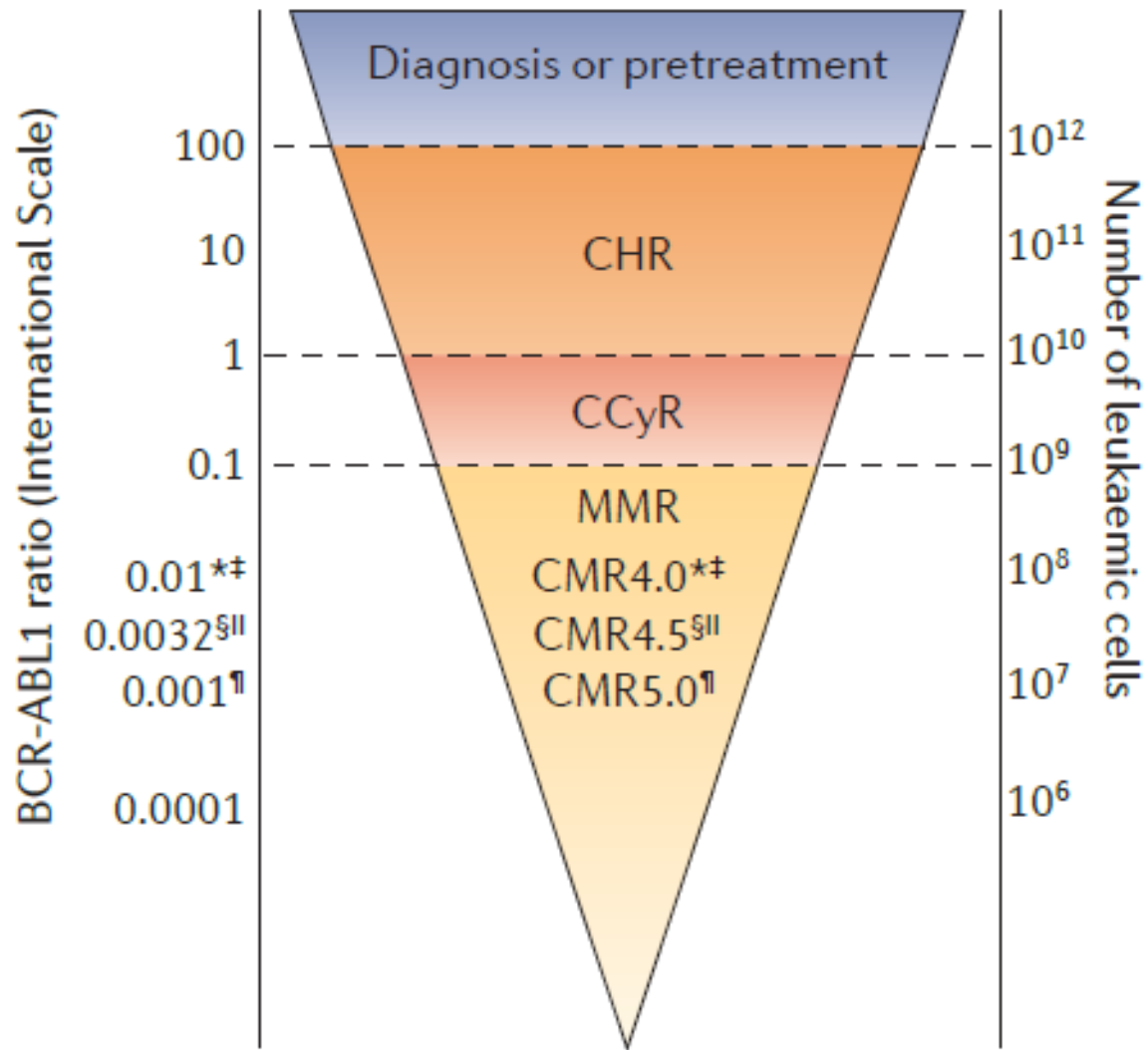*Thomas O'Hare, Matthew S. Zabriskie, Anna M. Eiring and Michael W. Deininger*

Abstract | Tyrosine kinase inhibitor (TKI) therapy targeting the BCR-ABL1 kinase is effective against chronic myeloid leukaemia (CML), but is not curative for most patients. Minimal residual disease (MRD) is thought to reside in TKI-insensitive leukaemia stem cells (LSCs) that are not fully addicted to BCR-ABL1. Recent conceptual advances in both CML biology and therapeutic intervention have increased the potential for the elimination of CML cells, including LSCs, through simultaneous inhibition of BCR-ABL1 and other newly identified, crucial targets.

CML Hierarchy and Haematopoiesis

Lineage⁻ CD34⁺ CD38⁻

LT-HSC

ST-HSC

MPP

Lineage⁻ CD34⁺ CD38⁺

CMP

CLP

CML blastic phase
Patients exhibit differentiation arrest and expansion of immature GMP cells

GMP

MEP

Lineage⁺

CML chronic phase
Patients show increased numbers of more mature myeloid cells

EB

MKP

Granulocyte   Monocyte   Red cells   Platelets   B cell   T cell   NK cell

# Monitoring Therapeutic Responses in CML

O'Hare T et al., *Nat Rev Cancer* 2012.

Two Independent Clinical Evaluations of First-Line Use of Nilotinib or Dasatinib Compared with Imatinib for Newly Diagnosed CML

O'Hare T et al., *Nat Rev Cancer* 2012.
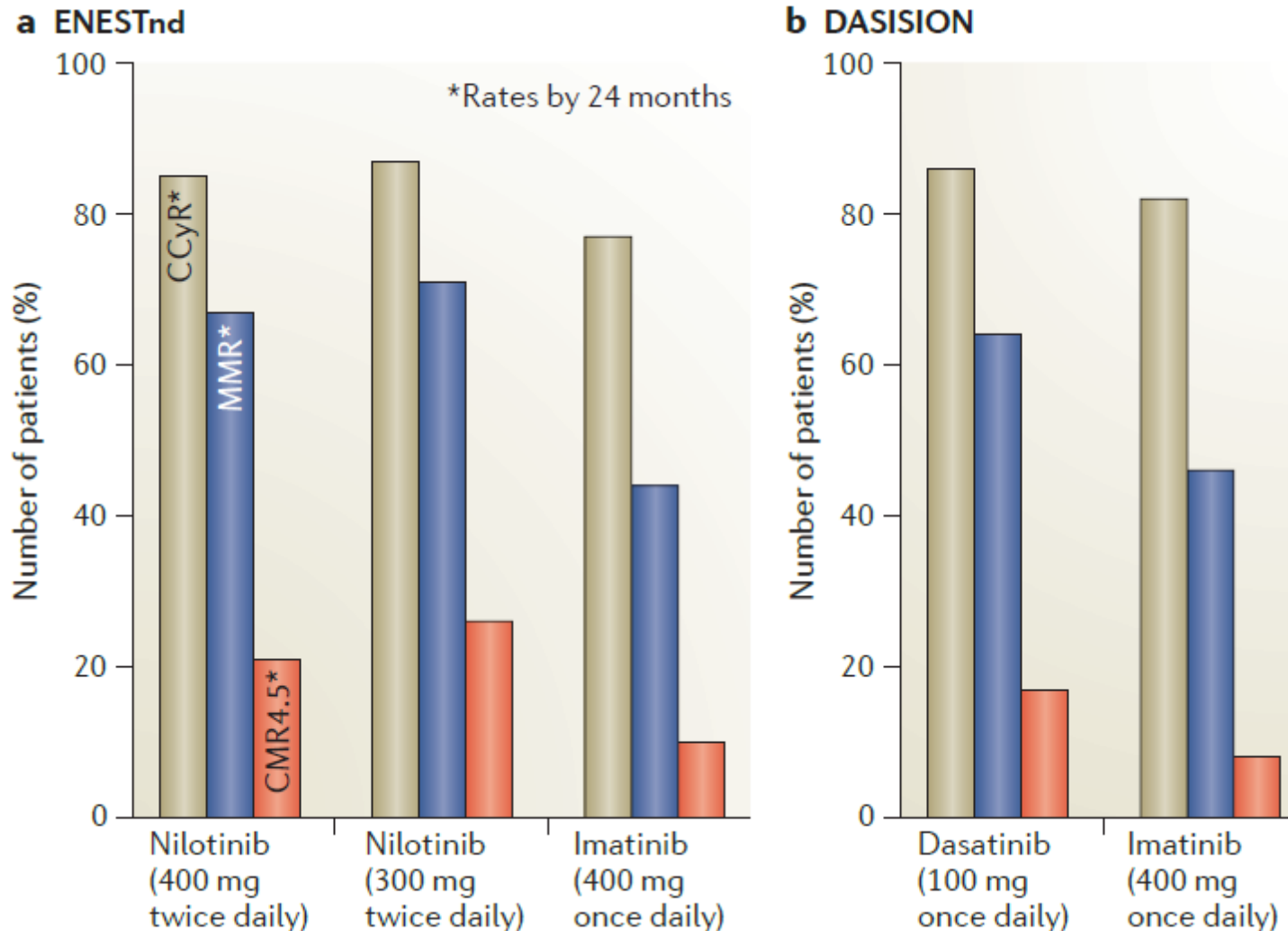
A Partially Overlapping Network of BCR-ABL1 Kinase Domain Mutations Confer Resistance to Certain TKIs

O'Hare T et al., *Nat Rev Cancer* 2012.
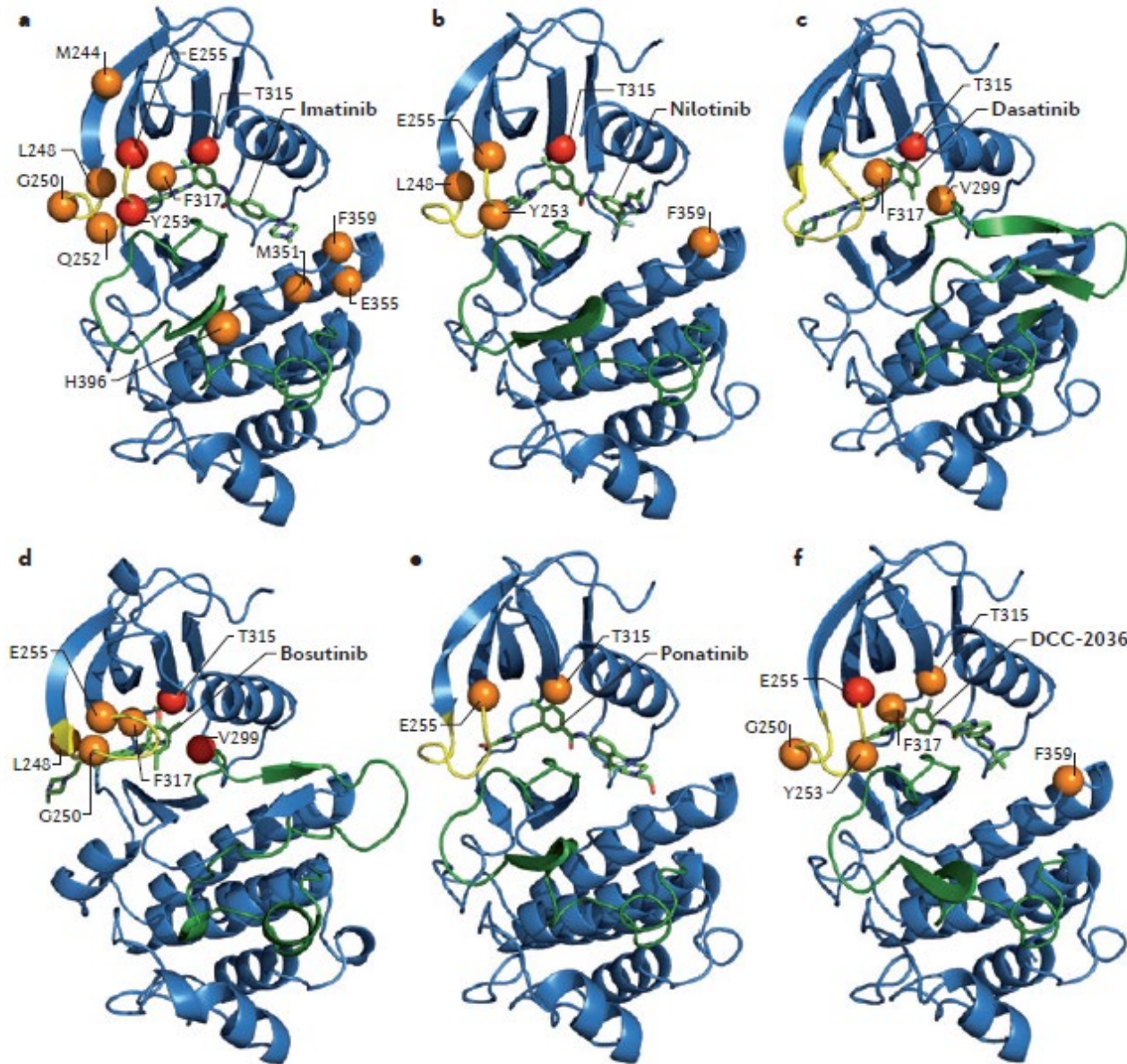
Targeting Opportunities in CML Cells

O'Hare T et al., *Nat Rev Cancer* 2012.
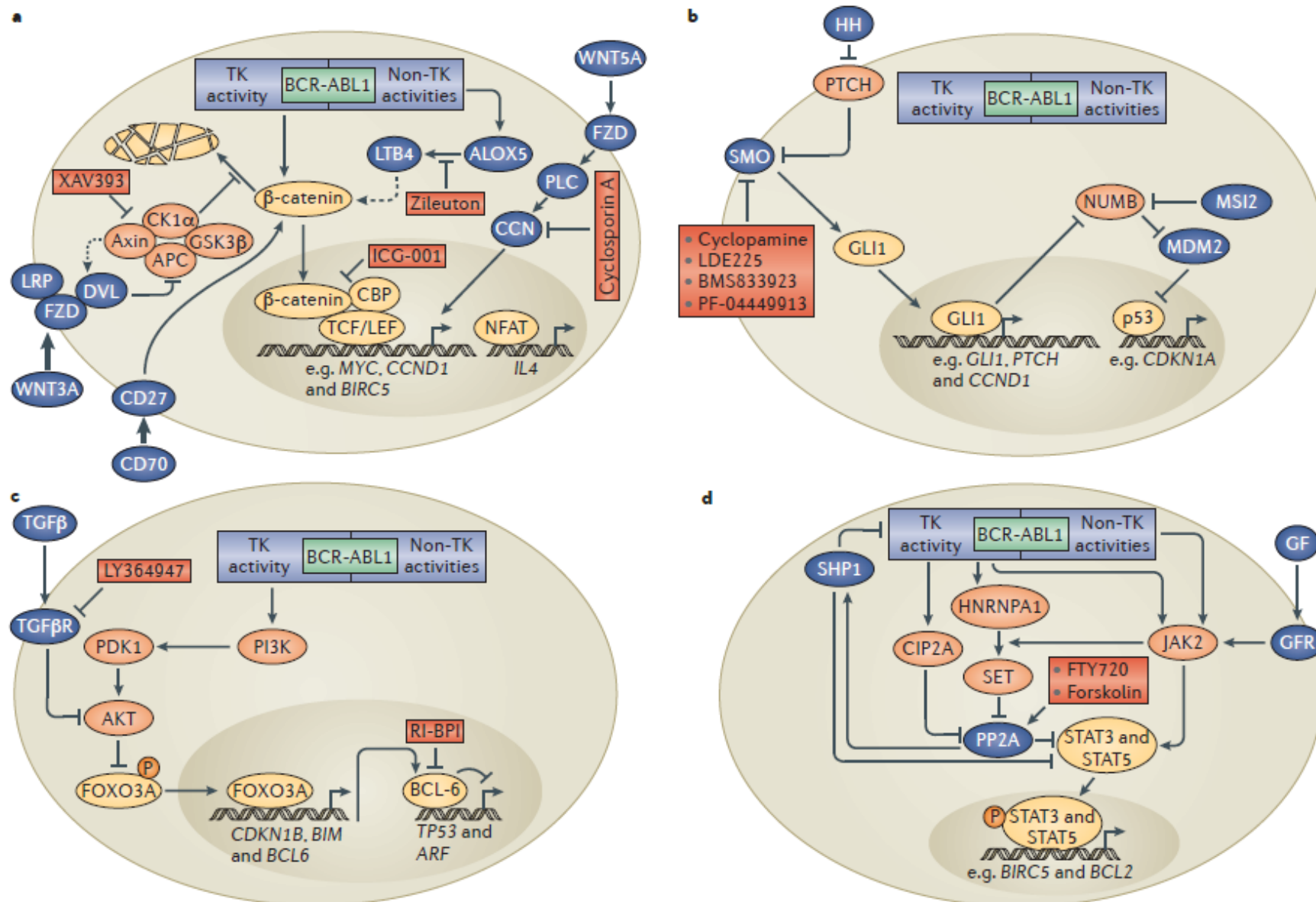
Discuss the Future of the Field

- Is there a consensus on where the field is going? Talk to your mentors and colleagues!

- Speculate on how the future will improve our understanding of the field.

- Are you presenting an argument that the readers can agree or disagree with?

Request Feedback

- Ask peers, mentors, and colleagues to provide feedback on your review article.

- They may help you interpret certain studies in new ways you may not have thought of before.

- Discussing your review with peers will improve the writing and prevent inaccuracies.

Reference Managers

Attribute	Endnote	Mendeley	Zotero	Paperpile
Cost	$340 ($150 for students)	Free version available	Free version available	Low with discounts
User Support	Extensive tutorials available; dedicated help desk	Extensive tutorials available; Global network of volunteers	Forum discussions to troubleshoot	Forum discussions to troubleshoot
Offline Use?	Desktop version available	Desktop version available	Desktop version available	Desktop version unavailable

Reference Managers

Attribute	Endnote	Mendeley	Zotero	Paperpile
Document Storage	Up to 2 GB (free version)	Up to 2 GB (free version)	Up to 300 MB (free version)	Storage linked to Google Drive
Compatible with Google Docs?	No	No	Yes	Yes
Collaborate	No group work	References can be shared/edited with up to 3 users	No limit to the number of users	No limit to the number of users.

Collaborative Writing Tools

Attribute	Manubot	Overleaf	Google Docs
Cost	Free, open source	$15-30 per month	Free, comes with a Google account
Writing Language	Type and write in Markdown	Type and format in LaTex	Standard word processor
Used with a Mobile Device?	No	No	Yes
References	Bibliographies are built using DOIs, circumventing reference managers	Citation styles can be imported from reference managers	Possible but requires additional referencing tools in a plug-in, such as Paperpile

Tips to Achieve Clarity

- Write statements in a **positive form**.

Instead of using	Use
• not efficient	inefficient
• not possible	impossible
• not negative	positive

This also helps with your word count!!

Tips to Achieve Clarity

- Use an **active tone** to bring energy and directness to your writing.

"The experiment was performed by Mayra."

"Mayra performed the experiment."

- Use a **passive tone** to when you want to avoid assigning responsibility.

"A decision will be made as soon as possible."

Tips to Achieve Clarity

- Use an **active tone** to bring energy and directness to your writing.

"The experiment was performed by Mayra."

"Mayra performed the experiment."

- Academic writing sometimes uses the **passive tone**.

"An experiment was performed to test the hypothesis."

Tips to Achieve Clarity

- Avoid fancy words and jargon; Choose words to convey your meaning with precision and clarity.

- Avoid excessive verbiage. Keep important words while avoiding conversational fillers: "I think," "basically," "probably."

In Summary…

- Literature reviews are valuable resources for the scientific community.

- With more and more original papers being published, review articles are increasingly important as a means to keep up-to-date with developments in a particular research or clinical area.

- Compiling years of scientific progress into a short review article is not easy.

- It requires a good understanding of literature and the implications of the discoveries made thus far.

In Summary…

- Give yourself plenty of time to write a scientific review article.

- Be focused and avoid jargon!

- Use an active tone to bring energy and directness to your writing.

- Ask peers, mentors, and colleagues to provide feedback on your review article.

Helpful Reading Material

- Paraminder Dhillon. How to write a good scientific review article. *FEBS J* 2022;289(13):3592-3602. PMID: 35792782

- Marco Pautasso. Ten simple rules for writing a literature review. *PLoS Comput Biol* 2013;9(7):e1003149. PMID: 23874189

- Andy Tay. How to write a superb literature review. *Nature* 2020 Dec 4. doi: 10.1038/d41586-020-03422-x. PMID: 33277634

- https://www.sjsu.edu/aanapisi/docs/writingareviewarticle.pdf

Thank You!!!!