

# Fusion Interpretation

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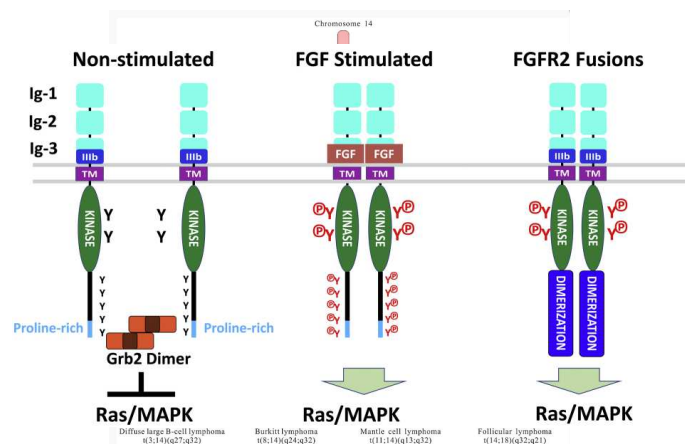
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## Rearrangements, Translocations, and Fusions

- Activating > Inactivating
- Chimeric protein with novel signal transduction
- Increased expression via altered regulation
- Elimination of negative regulator



Li F et al. Cytokine Growth Factor Rev. 2020.

Togashi Y et al. Mod Pathol. 2018.

Neckles C et al. Wiley Interdiscip Rev RNA. 2019.

## Pre-Review

- Batch findings
- Surgical pathology diagnosis
- Patient history, clinical context
  - Have they had fusion testing before?
  - What concurrent assays are being run?



## QC Review

- Amplification check
- Total sequencing reads
- % split reads
- Total variants
- Intragenic events

	Sample Quality		
	Pass	Cond.	Fail/repeat
RTcheck	≤ 30	30 - 35	≥ 35
Total reads non dup	≥ 1E6		
Split non-dup % (2x this value = RNAcontent)	≥ 20%		
Fusion calls	≥ 100	50 - 100	< 50



## Supportive Features to Sign the Case Out

- Appropriate tumor-gene fusion association
- Canonical partners and breakpoints, or at least described
- Breakpoints that lead to oncogenic function of gene fusion
- Sequence is in-frame
- Ancillary testing
  - Must know the biology and the test
  - Alternative test modality (FISH, IHC, ISH)



## Key Tools

- UCSC BLAT and Genome Browser
- ExPASy Translate
- Integrative Genomics Viewer
- Literature

