

Where is Neptune? Evolution on graphs and vestibular schwannoma

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Vestibular schwannomas are benign central nervous system tumours. When treated with radiotherapy, the tumours may become malignant instead of being successfully treated. It is not clear if radiotherapy is causative or not. By developing mathematical models in close collaboration with clinical geneticists, we can hypothesise that malignancy is more likely to be caused by a loss-of-function mutation than a gain-of-function mutation. By training the model on a combination of epidemiological, genomic, and clinical data, we can also constrain the size and location of this unknown gene, *TSX* [1]. We conclude that radiotherapy is probably safe for sporadic tumours, but the model has not yet been extended to inherited NF2 cases.

References

[1] C Paterson, MJ Smith, I Bozic, X Hoad, DGR Evans, “A mechanistic mathematical model of initiation and malignant transformation in sporadic vestibular schwannoma”, Under review, 2022.