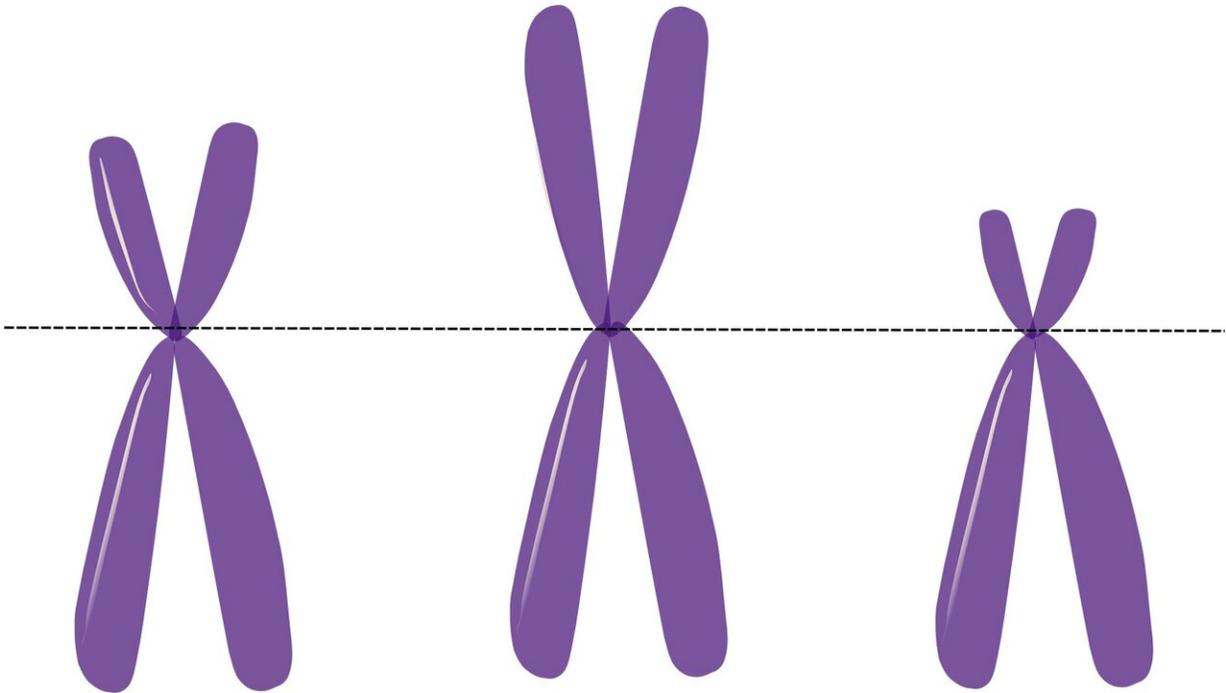


Men more genetically prone to skin cancer

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As COVID-19 restrictions loosen this summer, Canadians will spend more time outdoors and make the most of the sunshine. A new study from McGill University suggests why men may be more genetically prone to develop skin cancer.

The research led by Professor Ian Watson of McGill's Goodman Cancer Research Centre (GCRC), published in the journal *Nature Cancer*,

identified three [genes](#) on the X chromosome with significant [mutations](#). Females have two X-chromosomes whereas males have an X and a Y chromosome. "Of the three significantly mutated genes we found on the X-chromosome, only one gene had a specific type of mutation found only in males," says Prof. Watson.

Females can develop other types of mutations in the gene in question, but since they have two X chromosomes (males have one), they have two copies, allowing the second to serve as a backup if the first becomes mutated. "These mutations may help explain why male melanoma patients have [higher incidence](#) and worse survival rates," says Rached Alkallas, a Ph.D. student at McGill and the study's co-first author.

Genetic changes and UV

One of the most important risk factors for melanoma [skin cancer](#) is ultraviolet (UV) radiation from the sun and indoor tanning. By shedding light on specific genetic changes caused by UV exposure, advances in gene sequencing techniques have given researchers the ability to dig deeper into the underlying causes for the sex differences in melanoma. After analyzing genetic mutations in more than a thousand melanoma cases, researchers have provided some insight behind this mysterious sex bias. "We're continuing to do more research in this area, including determining how these mutations affect melanoma biology and respond to immunotherapy," explains Mathieu Lajoie, Ph.D., research associate and study co-lead.

More effective personalized treatment on the horizon

"Immunotherapy has been life-changing for many melanoma patients," Prof. Watson says of the form of treatment that reactivates a [cancer](#) patient's immune system to get rid of cancer cells. "Unfortunately, a

large subset of patients still don't respond to this treatment and we're working in collaboration to understand where the problems lie in order to connect all the dots."

In addition to the role gender plays in different incidence and survival rates, data is beginning to emerge that suggests they may also have different response rates to the latest forms of therapy. Watson is investigating whether the sex difference in mutations he uncovered might help explain the reason. Deepening our knowledge of the genetics of various [melanoma](#) subtypes could also go a long way in providing personalized treatment whereby patients are matched with the therapies that are most likely to treat their specific cancer.

More information: Rached Alkallas et al. Multi-omic analysis reveals significantly mutated genes and DDX3X as a sex-specific tumor suppressor in cutaneous melanoma, *Nature Cancer* (2020). [DOI: 10.1038/s43018-020-0077-8](https://doi.org/10.1038/s43018-020-0077-8)

Provided by McGill University

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