Systematic survey reveals unannotated human gene that's overexpressed in pituitary tumors

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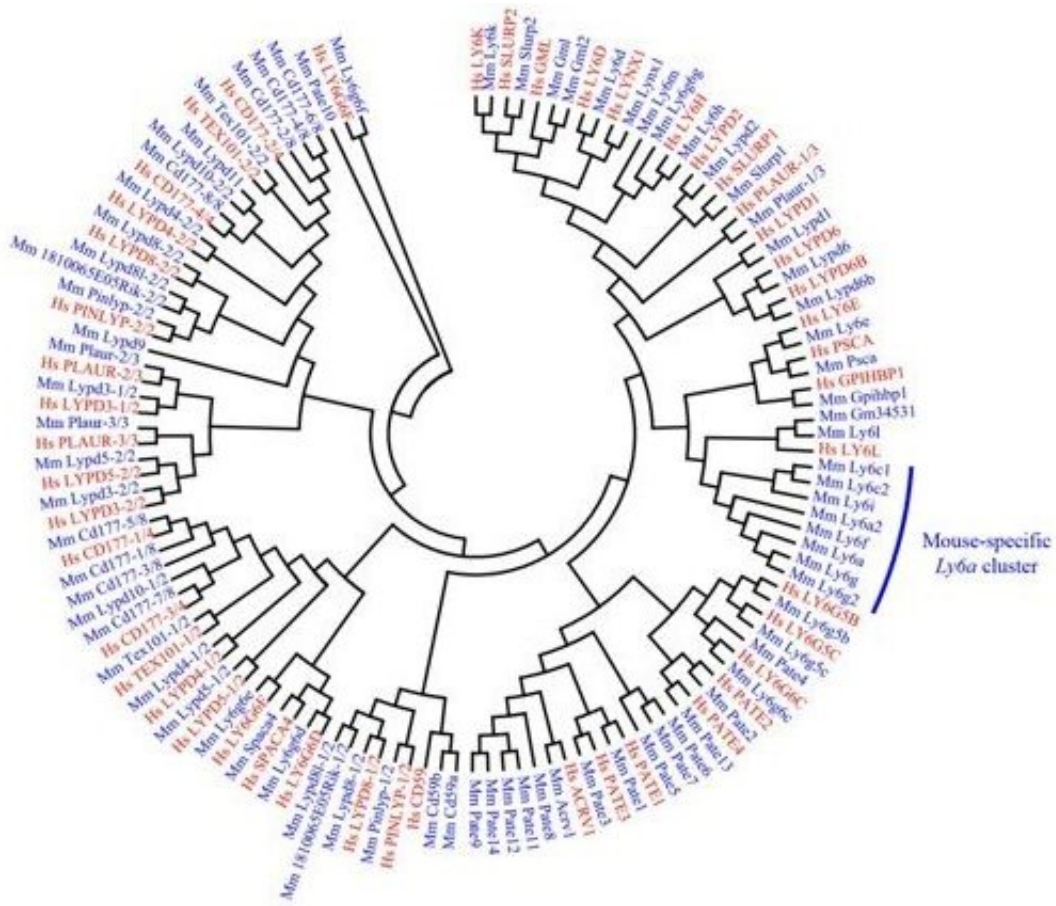

Credit: *Frontiers of Medicine* (2023). DOI: 10.1007/s11684-022-0968-4

A recent study focuses on the Ly-6 antigens, a family of proteins that contain a conserved LU domain. These antigens have been associated with stem cells and cancer stem cells. The mouse Ly-6A (also known as Sca-1) is a well-known marker for various stem cells, but its human homolog has been missing.

Dan Liu and his team at Shanghai Institute of Hematology, State Key Laboratory of Medical Genomics, National Research Center for Translational Medicine at Shanghai, Ruijin Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, China, conducted a systematic survey to identify LU domain-containing genes in humans and mice.

The researchers used a "reciprocal best hit" algorithm to search for orthologs between humans and mice. They performed RNA sequencing (RNA-seq) and data analysis to identify and validate the human LY6A gene. They also conducted experiments to clone the full-length cDNA of LY6A from pituitary tumors, where it was found to be overexpressed.

The researchers identified a previously unannotated human gene, LY6A, which is likely the ortholog of mouse Ly-6A/Sca-1. The human LY6A gene was found to be overexpressed in pituitary tumors compared to normal pituitary tissues.

The LY6A protein was validated to be properly processed and tethered to the cell membrane via its GPI anchor domain. The study also identified a high-frequency nonsynonymous coding single-nucleotide polymorphism (SNP) in the LY6A gene.

The identification of the human LY6A gene raises questions about the evolution, expression, and function of the Ly-6 family genes. The gene's overexpression in pituitary tumors suggests a potential role in tumorigenesis. The study also highlights technical issues in transcriptome

analysis that may lead to the misinterpretation of data and the missing of "hidden" genes.

The study successfully identified and cloned the human LY6A gene, which had been missing for decades. The gene's conservation, expression, and potential role in pituitary tumors provide valuable insights into stem cell biology and cancer.

The discovery of the human LY6A gene and its potential role in cancer could have significant implications for the development of new biomarkers and therapeutic targets for pituitary tumors and possibly other cancers.

The work is published in the journal *Frontiers of Medicine*.

More information: Dan Liu et al, A systematic survey of LU domain-containing proteins reveals a novel human gene, LY6A, which encodes the candidate ortholog of mouse Ly-6A/Sca-1 and is aberrantly expressed in pituitary tumors, *Frontiers of Medicine* (2023). DOI: 10.1007/s11684-022-0968-4

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