

# Genetic Cancer Predisposition

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## Members of the research group

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## Research

Prostate Cancer (PrCa) has a wide spectrum of clinical behavior that ranges from decades of indolence to rapid metastatic progression and lethality. PrCa is also among the most heritable of human cancers with 57% of the inter-individual variation in risk attributed to genetic factors. Our goal is to characterize and explain the mechanistic roles of predisposing gene variants, especially those associated with aggressive and lethal disease, including treatment response to therapies. The study is grounded on extensive prior studies of PrCa genetics that have given evidence to many significant genomic risk regions, such as 2q37.3, and 17q21-22. These regions has revealed several candidate genes with predisposing variants, for example *ANO7* at 2q37.3 and *HOXB13* at 17q21.2. The second research line is focusing on hereditary breast cancer (BrCa), especially *BRCA1/2* negative, early-onset disease, with patients of strong family history of BrCa. All work is based on powerful synergistic combination of the unique genomic and clinical data, efficient collaboration networks, and sophisticated data analyses.

## Selected publications (2015-)

1. Laitinen V, Rantapero T, Fischer D, Vuorinen EM, Tammela TLJ, PRACTICAL consortium, Wahlfors T, Schleutker J. Fine-mapping the 2q37 and 17q11.2-q22 loci for novel genes and sequence variants associated with a genetic predisposition to prostate cancer. *Int J Cancer*, 5;136(10):2316-2327, 2015.
2. Määttä K, Rantapero T, Lindström A, Nykter M, Kankuri-Tammilehto M, Laasanen S-L, Schleutker J. Whole exome sequencing of Finnish hereditary breast cancer families. *Eur J Hum Gen*, 25(1):85-93, 2017.
3. Gao P, Xia JH, Sipeky C, Dong XM, Zhang Q, Yang Y, Zhang P, Cruz SP, Zhang K, Zhu J, Lee HM, Suleman S, Giannareas N, Liu S; PRACTICAL Consortium, Tammela TLJ, Auvinen A, Wang X, Huang Q, Wang L, Manninen A, Vaarala MH, Wang L, Schleutker J, Wei GH. Biology and Clinical Implications of the 19q13 Aggressive Prostate Cancer Susceptibility Locus. *Cell*, 174(3):576-589, 2018.
4. Kaikkonen E, Rantapero T, Zhang Q, Taimen P, Laitinen V, Kallajoki M, Jambulingam D, Ettala O, Knaapila J, Boström PJ, Wahlström G, Sipeky C, Pursiheimo J-P, Tammela T, Kellokumpu-Lehtinen P-L, PRACTICAL Consortium, Fey V, Maehle L, Wiklund F, Wei G-H, Schleutker J. *ANO7* is associated with aggressive prostate cancer. *Int J Cancer*, 143(10):2479-2487, 2018.
5. Sipeky C, Gao P, Zhang Q, Wang L, Ettala O, Talala KM, Tammela TLJ, Auvinen A, Wiklund F, Wei G-H, Schleutker J. Synergistic interaction of *HOXB13* and *CIP2A* predispose to aggressive prostate cancer. *Clin Cancer Res*, 24(24):6265-6276, 2018.