Genetic Predisposition to Prostate Cancer

Principal investigators
Johanna Schleutker, PhD, Professor of Medical Genetics

Department of Medical Biochemistry and Genetics,
Institute of Biomedicine, University of Turku
Kiinamyllynkatu 10, FIN-20520 Turku, Finland
Tel: +358 2 333 7453, Fax: +358 2 230 1280
E-mail:johanna.schleutker@utu.fi

Research

Of all cancers, prostate cancer (PrCa) has been reported as one of the most heritable diseases. Genetic factors were recently estimated to account for 58% of the risk, using data from the Nordic Twin Study of Cancer. However, genetics has proven challenging because of the very heterogeneous nature of the disease. Our goal is to identify and characterize predisposing genes and variants, especially those affecting aggressive outcome, including treatment response to therapies. This data will have diagnostic utility at an early, curable stage of the disease. Further, the aim is to develop tools for prognostic purposes, i.e. prognostic biomarkers, which are urgently needed in PrCa screening and clinical practice. In our previous work we have identified significant genomic regions, candidate genes and variants, which are further profiled and characterized.
Links:http://www.utu.fi/fi/yksikot/med/yksikot/LBKG/tutkimus/Sivut/Genetic-Predisposition-to-Cancer.aspx

Current topics

- Fine-mapping of identified genomic regions on 11q13, 17q21-22, 2q37.3
- Imputing, eQTL and NGS applications (DNA and RNA-seq)
- Functional studies of lethal disease associated variants
- Participation to large international consortium GWAS and meta-analysis

Recent publications (2011-)

Nurminen R, Wahlfors T, Fischer D, Tammela TLJ, Schleutker J. Identification of an aggressive prostate cancer predisposing variant at 11q13. *Int J Cancer* 129(3):599-606, 2011.

Laitinen V, Wahlfors T, Saaristo L, Rantapero T, Pelttari LM, Kilpivaara O, Laasanen S-L,Kallioniemi A, Nevanlinna H, Aaltonen L, Vessella RL, Auvinen A, Visakorpi T, Tammela TLJ, Schleutker J. HOXB13 germline G84E mutation in Finland; population-based analysis of prostate, breast and colon cancer risk. *Cancer Epidemiol Biomarkers Prev* 22(3):452-60, 2013.

Nurminen R, Lehtonen R, Auvinen A, Tammela TL, Wahlfors T, Schleutker J. Fine mapping of 11q13.5 identifies regions associated with prostate cancer and prostate cancer death. *Eur J Cancer* 49(15):3335-43, 2013.

Chen LS, Fann JC, Chiu SY, Yen AM, Wahlfors T, Tammela TL, Chen HH, Auvinen A, Schleutker J. Assessing interactions of two loci (rs4242382 and rs10486567) in Familial Prostate Cancer: Statistical Evaluation of Epistasis. *PLoS ONE* 9(2):e89508, 2014.

Breyer JP, Bradley KM, Dorset DC, Clark TA, McReynolds K, Hock RL, Pereira JK, Maynard WH, Chang SS, Cookson MS, Smith JA, Schleutker J, Dupont WD, Smith JR. An expressed retrogene of master embryonic stem cell factor OCT4 alters prostate cancer susceptibility. *Am J Hum Genet* 94(3):395-404, 2014.

Personnel

Senior scientists/post docs
Csilla Sipeky, Vidal Fey, Juha Pursiheimo

PhD students
Elina Kaikkonen, Virpi Laitinen,
Riikka Nurminen, Kirsi Kuusisto

Technicians
Katri Kylä-Mattila, Jukka Karhu