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New RCSI research discovers how oestrogen can reduce risk of liver and heart disease in women

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A team of researchers from the Royal College of Surgeons in Ireland (RCSI) and the University of California (UC Irvine) have discovered how oestrogen can reduce the risk of liver and heart disease. The study was recently published in the Science journal Science Signalling.

The research shows the beneficial effect that oestrogen (the female hormone) has on liver metabolism by revealing a new type of oestrogen receptor which controls oestrogen-responsive genes that regulate cholesterol and fatty acid production.

Speaking on the study, Professor Brian Harvey, RCSI Principal Investigator, said 'Oestrogen tends to protect women against high cholesterol and heart disease during the child-bearing years. Our research has allowed us to gain important insights into how oestrogen may suppress some genes and prevent excessive accumulation of cholesterol and triglycerides in the blood that can progress to heart disease and liver cancers. This leaves the door open for the development of drugs that can decrease the incidence of liver and heart disease in women'.

This female-specific study showed that oestrogen binds to a new type of oestrogen receptor at the cell membrane and not in the nucleus of the cell. This activates a network of enzymes which slows down a regulator of genes (SREB) which usually drive the build-up of cholesterol in the liver. Oestrogen was also found to suppress lipid metabolism in general, including the accumulation of fatty acids and harmful triglycerides.

The RCSI team included post-doctoral fellow Fiona O' Mahony, a Marie Curie fellow working between Dublin and California, and the father-son combination of Prof Brian Harvey and Harry Harvey. Brian is Professor of Molecular Medicine and Harry recently completed a PhD in cancer genetics at the College.

The team at UC Irvine was led by chief endocrinologist Dr Ellis Levin, who said 'Oestrogen may be a deterrent to liver cancer, as men get this type of cancer at a

rate of four-to-six times more than women. The team is now testing compounds that target the membrane oestrogen receptor to see the impact for such diseases.'

The study was conducted over four years and was supported by grants from the National Institutes of Health and the Department of Veterans Affairs USA, the EU Marie Curie Actions, the Higher Education Authority Programme for Third Level Institutions (PRTLl) and the National Biophotonics Imaging Platform Ireland.