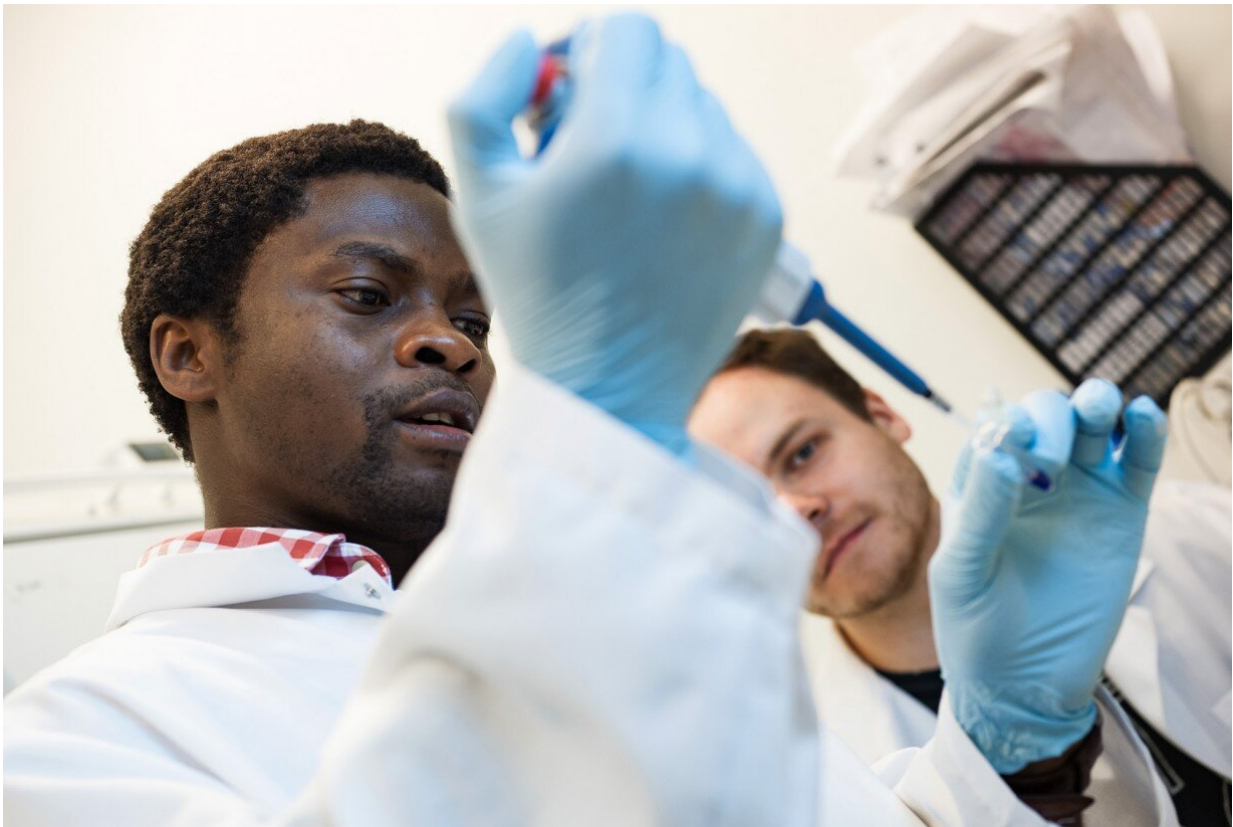


Researchers discover novel non-coding RNAs regulating blood vessel formation

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Credit: University of Eastern Finland

Researchers at the University of Eastern Finland have discovered previously unknown non-coding RNAs (ncRNAs) involved in regulating the gene expression of vascular endothelial growth factors (VEGF), the

master regulators of angiogenesis. The study, conducted by the research groups of Associate Professor Minna Kaikkonen-Määttä and Academy Professor Seppo Ylä-Herttuala, provides a better understanding of the complex interplay of ncRNAs with gene regulation, which might open up novel therapeutic approaches in the future. The results were published in *Molecular and Cellular Biology*.

In recent years, the development of next generation sequencing techniques has revealed that around 97% of the human transcriptome is transcribed as non-coding RNAs, and although the role of the vast majority remains uncharacterized, many functions such as [gene regulation](#) have been proven.

On the other hand, endothelial growth factors VEGF-A and VEGF-C are the main regulator of angiogenesis, i.e., new blood vessel formation. Due to their important role in vasculature development, they constitute a potential target for the treatment of several diseases, such as atherosclerosis. Therapeutic angiogenesis has been developed as a promising strategy to rescue ischemic tissues by induction of new blood vessels sprouting from existing vasculature but so far, very few results with clinical significance have been achieved. Therefore, a deeper understanding of the regulatory mechanisms underlying the expression of these key angiogenic factors is needed for the future therapeutic avenues.

In this study, researchers performed in-depth characterization of the genomic loci around the VEGFA and VEGFC [genes](#) and identified novel non-coding RNAs, in particular enhancer RNAs (eRNAs) and long non-coding RNAs (lncRNAs). While the enhancers clearly upregulated gene expression, lncRNAs demonstrated various functions. Interestingly, lncRNAs were also regulating other targets including factors related to endothelial functions, such as angiogenesis and cell proliferation.

More information: Isidore Mushimiyimana et al. Genomic landscapes of non-coding RNAs regulating VEGFA and VEGFC expression in endothelial cells, *Molecular and Cellular Biology* (2021). [DOI: 10.1128/MCB.00594-20](https://doi.org/10.1128/MCB.00594-20)

Provided by University of Eastern Finland

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