Medical Xpress

Long noncoding RNAs emerge as promising biomarkers for mood disorders

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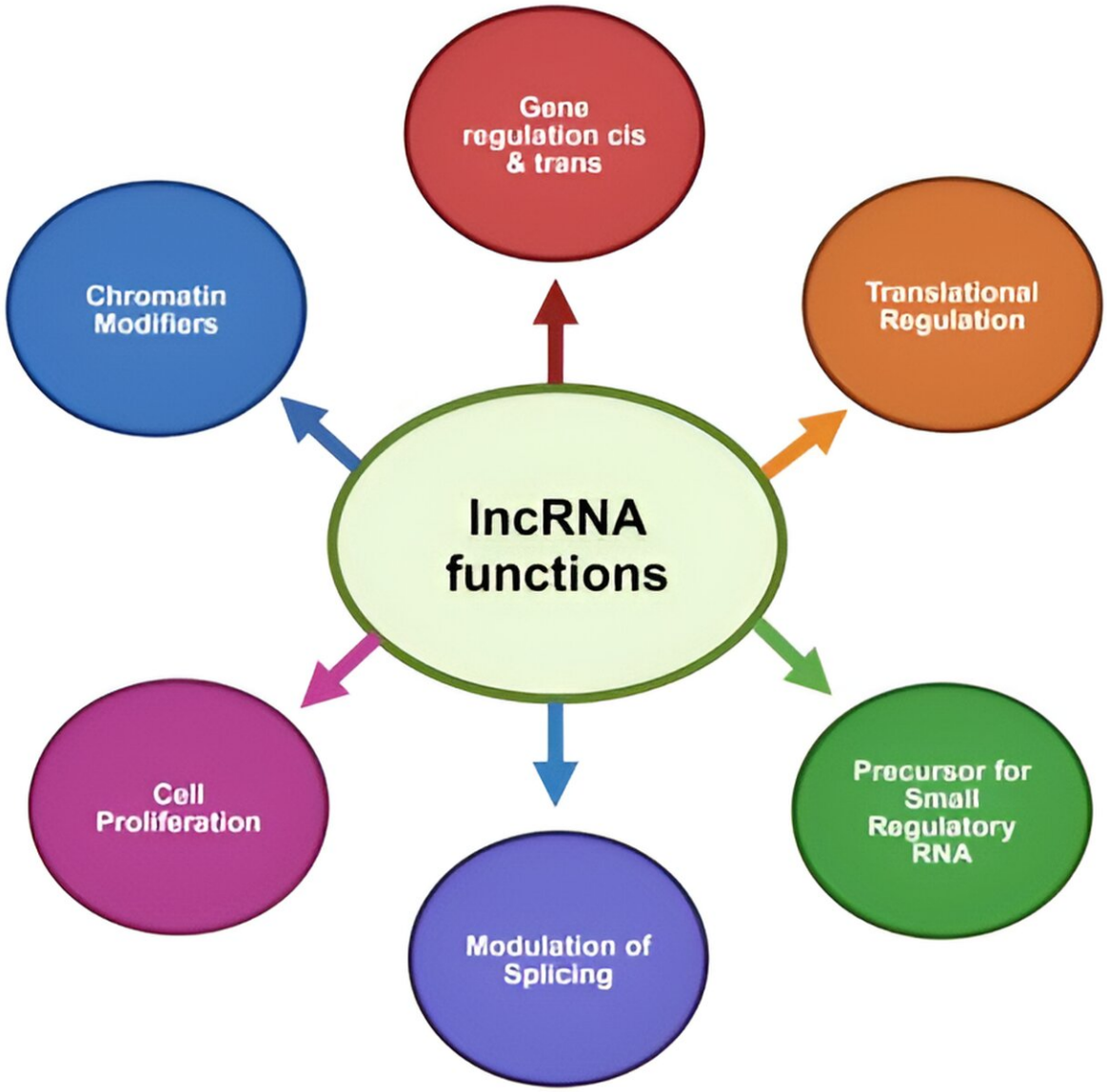

The network plot illustrates the interconnectedness of three distinct mood

disorders (major depressive disorder: MDD, bipolar disorder: BD, and suicidal behavior: SB) based on shared lncRNA profiles detected in the peripheral circulation. Credit: *Genomic Psychiatry* (2024) DOI: 10.61373/gp024i.0046

In a review article, researchers have uncovered compelling evidence that long noncoding RNAs—molecules once dismissed as "junk DNA"—may hold the key to revolutionizing how we diagnose and treat mood disorders.

The study, "Circulating long noncoding RNA: New frontiers in biomarker research for mood disorders," published in the journal *Genomic Psychiatry*, reveals that these RNA molecules circulating in blood samples could serve as powerful biomarkers for conditions like major depression and bipolar disorder, potentially leading to more accurate diagnoses and personalized treatments.

"For years, clinicians have struggled with the subjective nature of diagnosing mood disorders," said Dr. Yogesh Dwivedi, senior author of the study. "Our review shows that lncRNAs detectable in blood samples may offer an objective way to identify these conditions and even predict how patients will respond to different therapies."

The researchers synthesized findings from dozens of recent clinical studies examining lncRNA levels in patients with major depressive disorder (MDD) and bipolar disorder (BD). They found consistent patterns of altered lncRNA expression in these individuals compared to healthy controls. For example, six specific lncRNAs showed reduced levels in patients with MDD, while others like MALAT1 were dysregulated in BD.

Intriguingly, some lncRNAs appeared to correlate not just with

diagnosis, but with symptom severity and even risk of suicide. "We found that expression of certain lncRNAs, like RMRP, tracked with depression severity scores," Dwivedi noted. "This suggests they could potentially be used to monitor disease progression or treatment response over time."

The review also highlights the promise of lncRNAs as therapeutic targets. Because these molecules play key roles in regulating gene expression, correcting their dysregulation could potentially address underlying disease mechanisms. Several animal studies have already shown promising results using this approach.

While the findings are exciting, the authors caution that more research is needed before lncRNA-based tests or treatments become clinical realities. Large-scale studies are still required to validate many of the potential biomarkers identified. Additionally, standardized protocols for sample collection and analysis need to be developed to ensure consistent results across different labs and clinics.

Nevertheless, the review paints an optimistic picture of the future of mood disorder diagnosis and treatment. "We're on the cusp of a new era in psychiatry," Dwivedi said.

"These tiny RNA molecules circulating in our blood may soon allow us to diagnose mood disorders as objectively as we diagnose diabetes or heart disease. That could be transformative for millions of patients worldwide."

More information: Roy et al. Circulating long noncoding RNA: New frontiers in biomarker research for mood disorders. *Genomic Psychiatry* (2024) DOI: 10.61373/gp024i.0046. gp.genomicpress.com/wp-content … 046-Dwivedi-2024.pdf

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