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► **COVER:** 'Cellular bodies' by Vicky Askew, inspired by the Review on p9 and the Opinion on p85



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Many proteins and nucleic acids in cells locate to distinct structures — called foci, granules or bodies — that can be visualized under the microscope. Whereas some of these structures, such as nucleoli and Cajal bodies, have been known for many decades and are well characterized, others have been more elusive and have been described only recently.

mRNA-processing (P) bodies were identified less than 10 years ago and had initially been associated with mRNA-degradation activity, explaining their name. But as Ana Eulalio, Isabelle Behm-Ansmant and Elisa Izaurralde discuss on page 9, several other post-transcriptional processes, including translational repression and RNA-mediated gene silencing, seem to converge in these dynamic structures. However, whether P-body integrity is essential for each of these processes requires further investigation.

A related cytoplasmic structure that is present in male germ cells — the chromatoid body — was first described more than a century ago, but its function has been a mystery until recently. In fact, P bodies and chromatoid bodies might have overlapping roles, as Noora Kotaja and Paolo Sassone-Corsi explain in an Opinion article on page 85, because both seem to function in mRNA-decay pathways and microRNA-mediated gene silencing. Proteomic studies might help to elucidate the biochemical differences between these related types of cytoplasmic body.

The spatial regulation of RNA-mediated gene silencing is intriguing. But Tariq M. Rana (page 23) tackles a more fundamental question about what makes small RNAs trigger gene silencing. A better understanding of the chemical and structural properties of small RNAs might help us to clarify the mechanisms by which RNA molecules silence genes and provide guidelines to silence genes more efficiently.

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