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In This Issue

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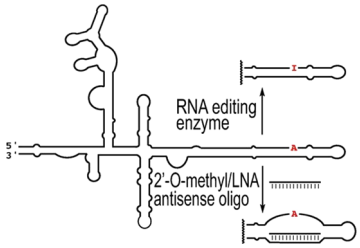
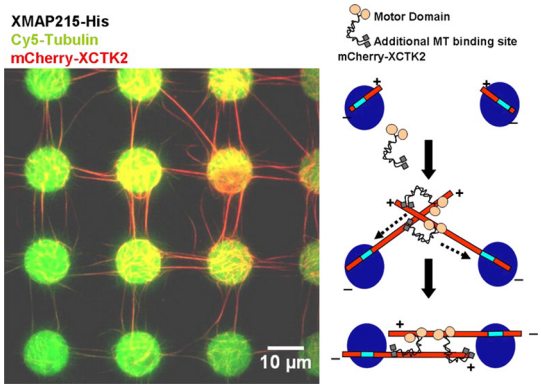
A SENSIBLE APPROACH FOR EXPLORING EDITING ENZYMES



The adenosine deaminase acting on RNA (ADAR) family of RNA editing enzymes deaminate adenosines in RNA sequences to form inosine. Like all good editors, these enzymes are meticulous in their actions, binding tightly to regions of double helical RNAs in a site-specific manner. Though some ADAR activity results in actual coding changes with potential ramifications in protein structure or function, most ADAR editing sites are in untranslated regions of RNA with poorly understood consequences. To help clarify the biological relevance of RNA editing, Mizrahi *et al.* (DOI: 10.1021/cb300692k) present the design of antisense oligonucleotides as potent and selective ADAR inhibitors.

Key to their strategy was the development of antisense oligonucleotides that specifically bound to stable duplex regions of the target RNA, and the incorporation of a backbone structure that best supported the tight binding needed between the antisense oligonucleotide and the RNA target. These parameters were used in the creation of a potent and selective ADAR inhibitor targeting the mRNA for the DNA repair glycosylase NEIL1, offering a new approach for investigating the role of RNA editing in DNA repair pathways.

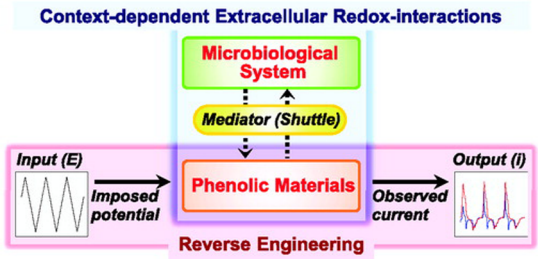
MICROPATTERNS FOR MICROTUBULES



Microtubules, key components of the cellular cytoskeleton, are involved in numerous aspects of movement in the cell including organelle transport, cell motility, and cell division. The dynamic nature of microtubule structures facilitates these processes, and though the composition of and regulatory molecules associated with microtubule formation have been extensively investigated, less is known about the factors that govern microtubule architecture in the cell. Now, Ghosh *et al.* (DOI: 10.1021/cb300583p) present a method for exploring the biochemical and physical factors involved in building complex microtubule architectures.

By immobilizing microtubule polymerase on chemically functionalized glass surfaces, the authors were able to monitor microtubule growth by adding purified tubulin and a fluorescent derivative of a protein that selectively binds to microtubules. Using this system, they systematically investigated the effects of various parameters in microtubule dynamics, such as the density of the polymerase, the tubulin concentration, and the presence of motor proteins.

TAGGING HEXYLCHLORIDE WITH HALOTAG



Small molecules derivatized with special chemical tags, such as fluorescent compounds or high affinity protein ligands like biotin, are excellent tools for isolating, purifying, and characterizing various biomolecules. Numerous strategies for instilling bioorthogonal chemical handles onto small molecules have been developed recently, each with their own set of advantages and challenges. Adding to this valuable toolkit of chemical probes, Brigham *et al.* (DOI: 10.1021/cb300623a) now present use of a hexylchloride group as a new bioorthogonal tag for protein enrichment studies.

The hexylchloride group is an attractive molecular tag because it selectively reacts with HaloTag, an engineered form of a dehalogenase enzyme, resulting in covalent attachment of the tag to the enzyme. The authors cleverly constructed a fusion protein containing HaloTag, a protease cleavage site, and an immobilization domain, such that small molecules or proteins displaying a hexylchloride moiety could be selectively captured and then released if desired. The authors demonstrate the utility of this approach by enriching protein kinases from mammalian cell lysates.

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