## Breaker Laboratory Molecule of the Year 2007b

## 'Boutique' Riboswitches

**Moco and Tuco Riboswitches** 

**Fig. 3.** Examples of riboswitch classes that are exceedingly rare in bacterial species. Only two representatives of 2'-deoxyguanosine riboswitches (left) are known to exist in a single organism (Mesoplasma florum). Only a few examples of preQ<sub>1</sub>-II riboswitches (right) are known to exist.

**Fig. 4.** Consensus sequence and structural model for Moco RNAs. Moco RNAs exhibit characteristics of riboswitches that sense molybdenum cofactor (Moco), although some variants lack the P3 stem and exhibit characteristics expected for tungsten cofactor (Tuco) riboswitches.



In recognition of the discovery of rare<sup>1,2</sup> and novel<sup>3</sup> riboswitch classes, the status of Breaker Laboratory "Molecule of the Year" is conferred upon these new-found riboswitch classes.

The vast majority of riboswitches discovered to date belong to classes of metabolite-sensing RNAs that are very widespread amongst bacterial species. However, some have argued that if most of the common riboswitch classes have been identified, then the total number of novel riboswitch classes is probably low. However, the discovery of riboswitches for Moco/Tuco (which appear to be able to discriminate against cofactors containing molybdate or tungstate) suggest that there could be many additional common riboswitch classes to be discovered. Furthermore, the discovery of the rare riboswtch representatives or 'boutique' riboswitches that bind 2'-deoxyguanosine and  $preQ_1$  suggest that there might be a great many obscure but novel riboswitch classes remaining to be discovered.

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