

**Invited Address:
Rostral Prefrontal Cortex: the Seat of Metacognition**

Presenter: Paul W. Burgess

8:45–9:45 a.m.

P.W. BURGESS. Rostral prefrontal cortex: the seat of metacognition.

Most of the brain deals with information relating to present or past experience. In contrast, the frontal lobes are the seat of “the future” in human cognition. They support processing relating to “what if..?” thoughts, such as “what if X happened?” or “what would happen if I did it this way rather than the usual way?” They also then enable us to carry out these future new courses of action. The possibilities we consider are shaped by our knowledge of social rules, what we know or believe about ourselves or think that we know about other people, our risk preferences and how we understand them, and a range of other types of processing such as our propensity to mind-wander, to maintain an inner dialogue with ourselves, or conversely to attend carefully to the external world and not get distracted by our inner thoughts. Arguably, these are the highest cognitive functions of man. Very recently, work has begun to show that the largest single subpart of the frontal lobes (variously called rostral PFC, area 10, or frontopolar cortex), which is the anterior part just behind the forehead, plays a critical role in these kinds of “metacognitive” processes. People with damage to rostral PFC can show a range of problems in everyday life, including changes in social behaviour, judgement, and their ability to organise themselves, and carry out intended actions. Remarkably, the latest evidence from neuropsychological and neuroimaging studies, plus investigations of autism spectrum disorders, strongly suggests that rostral prefrontal cortex shows a high degree of functional specialisation, with different sub-regions contributing to different kinds of processing. The new discoveries about what this region does, after approximately 150 years of almost complete ignorance about it, holds the promise of understanding many clinical phenomena that have until now been considered mysterious and not amenable to assessment or intervention.

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