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Review

Toward a cross-species understanding of empathy

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Highlights

- Signs of empathy have been observed in many mammals, including laboratory rodents.
- 'Primal empathy' utilizes the seven basic emotional systems of the mammalian brain.
- Affective neuroscience approaches can elucidate the underlying brain substrates.
- Continued study of primal empathy in rodents will benefit mental health practices.
- A neuro-evolutionary paradigm can illuminate how empathy is expressed in humans.

Although signs of empathy have now been well documented in non-human primates, only during the past few years have systematic observations suggested that a primal form of empathy exists in rodents. Thus, the study of empathy in animals has started in earnest. Here we review recent studies indicating that rodents are able to share states of fear, and highlight how affective neuroscience approaches to the study of primary-process emotional systems can help to delineate how primal empathy is constituted in mammalian brains. Cross-species evolutionary approaches to understanding the neural circuitry of emotional 'contagion' or 'resonance' between nearby animals, together with the underlying neurochemistries, may help to clarify the origins of human empathy.

Keywords

affective neuroscience; rodent; social behavior; emotion; contagion; reciprocity; anterior cingulate cortex