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From group average to personalized analysis of the impact of juvenile stress as a risk factor of psychopathologies

 Abstract:
PTSD follows an exposure to a traumatic event, but only in about 15-20% of the exposed individuals. These proportions indicate that the trauma is not sufficient to induce PTSD and that it must interact with pre-existing risk factors if to lead to PTSD. Exposure to childhood adversities is considered in humans to be a risk factor and we could demonstrate that exposure to adversities in juvenility (the developmental period homologous to human childhood) indeed leads to increased susceptibility to developing PTSD later on.
However, even when combining juvenile and adulthood stress, not all individuals are affected. Diagnosis of psychopathologies in humans is based on diagnosis of individuals. Many animal models however, analyze averaged group effects, compromising their translational power. To address that limitation, we have developed a novel behavioral profiling approach allowing differentiating between exposed-affected and exposed-unaffected individuals. Identifying the affected individuals enables focusing on brain mechanism associated with developing psychopathology.
Furthermore, the behavioral profiling analysis enables examining also those animals that were exposed to the trauma but did not develop symptoms. By this, the behavioral profiling approach enables also research into the neurobiology of stress resilience. Indeed, employing this analysis we could identify epigenetic alterations specific to resilient individuals.