

## **Chemical Genomics To Unravel Auxin Perception Controlling Arabidopsis Seedling Development**

Thomas Vain<sup>1</sup>, Noel Ferro<sup>2</sup>, Deepak Kumar Barange<sup>3</sup>, Qian Ma<sup>1</sup>, Mattias Thelander<sup>1</sup>, Barbora Pařízková<sup>4</sup>, Ondřej Novák<sup>4</sup>, Siansa M. Doyle<sup>1</sup>, Alexandre Ismail<sup>5</sup>, Per Anders Enquist<sup>3</sup>, Adeline Rigal<sup>1</sup>, Malgorzata Langowska<sup>1</sup>, Yi Zhang<sup>6</sup>, Karin Ljung<sup>1</sup>, Judy Callis<sup>7</sup>, Fredrik Almqvist<sup>3</sup>, Mark Estelle<sup>6</sup>, Laurens Pauwels<sup>8</sup> and Stéphanie Robert<sup>1</sup>

<sup>1</sup>Swedish University of Agricultural Sciences, <sup>2</sup>Bonn University, <sup>3</sup>Umeå University, <sup>4</sup>Palacký University, <sup>5</sup>Sup'Biotech, IONIS Education Group, <sup>6</sup>University of California San Diego, <sup>7</sup>University of California Davis, <sup>8</sup>ViB-PSB

Auxin phytohormones control most aspects of plant development through a complex and interconnected signaling network. In the presence of auxin, AUXIN/INDOLE-3-ACETIC ACID (Aux/IAA) transcriptional repressors are targeted for degradation by the SKP1-CULLIN1-F-BOX (SCF) ubiquitin-protein ligases containing TRANSPORT INHIBITOR RESISTANT 1/AUXIN SIGNALING F-BOX (TIR1/AFB). CULLIN1-neddylation is required for SCF<sup>TIR1/AFB</sup> functionality as exemplified by mutants deficient in the NEDD8-activating enzyme subunit AUXIN-RESISTANT 1 (AXR1). Redundancy within the auxin perception machinery hinders chemical genomics approaches to the identification of auxin analogs. Here, we report four small molecules named DEVELOPMENTAL REGULATORS (DRs) requiring AXR1 and SCF<sup>TIR1/AFB</sup> to modulate plant development. Three DR molecules trigger selective auxin responses at transcriptional and morphological levels.