

CAREER DEVELOPMENT AWARDEES



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Laurea	<i>Università di Roma La Sapienza 7 July 1994</i>
Ph.D	<i>Università di Roma La Sapienza March 28 1998</i>
Postdoc	<i>University of Utrecht, The Netherlands, July 1998 – March 2003</i>
Previous work experience	<b>Mechanisms involved in the relation between cell identity and cell proliferation control in the <i>Arabidopsis thaliana</i> root meristem. Major: Developmental Biology, Molecular biology, Cell Biology, Genetic.</b>

Research  
Interests



Post-embryonic growth and development in higher plants occurs from localized regions called meristems. Important developmental decisions, affecting cell division and cell fate determination, are taken in the meristems, which give rise to adult structures of the plant, like shoots and roots. Two hormones, auxin and cytokinin, have long been recognized as crucial signaling molecules controlling shoot and root meristem activity. They are believed to act synergistically and antagonistically during shoot and root organogenesis by controlling fundamental developmental processes such as cell fate decision, cell division and cell polarity. Classic *in vitro* plant tissue culture experiments demonstrated that both auxin and cytokinin are required to induce cell division and that different auxin-cytokinin ratios lead either to root or shoot formation. However, little is understood concerning the *in vivo* significance of these tissue culture experiments and the mechanisms by which the two hormones act in concert to exert these effects. In addition to this complexity, the mode of interaction between auxin and cytokinin is often dependent upon the plant species and organ being studied. This has hampered, so far, the establishment of a general model for the control of plant growth and development by these hormones.

We are using the *Arabidopsis thaliana* root meristem as an experimental system to clarify the role of cytokinin at the cellular and molecular level.

The root meristem contains a simple and well-defined tissue organization,

	<p>allowing developmental alterations to be easily characterized. In addition, all cell types can be identified by anatomy and by a collection of cell and tissues specific markers.</p> <p>We are currently focusing on three interrelated areas of research: 1) the role of cytokinin at the cell and tissue level during <i>Arabidopsis</i> root development, 2) the identification and characterization of the molecular components through which cytokinin controls specific effects during root development and 3) how cytokinin interacts with auxin-dependent pathways during root development.</p>
<p><b>Selected Publications</b></p>	<p>Dello Iorio R., Scaglia Linhares F., Scacchi E., Casamitjana-Martinez E., Heidstra R., Costantino P., <b>Sabatini S.</b> Cytokinins control root meristem size by controlling cell differentiation. <b>Current Biology</b> <i>in press</i> (2007)</p> <p><b>Sabatini S.</b>, Heidstra R., Scheres B: Scarecrow is involved in positioning the stem cell niche in the <i>Arabidopsis</i> root meristem. <b>Gene &amp; Development</b> 17, 354-358, (2003).</p> <p><b>Sabatini S.</b>, Beis D., Wolkenfelt H., Murfett J., Guilfoyle T., Malamy J., Benfey P., Leyser O., Bechtold N., Weisbeek, P. and Scheres, B. An Auxin-dependent distal organizer of pattern and polarity in the <i>Arabidopsis</i> root. <b>Cell</b> 99, 463-472, (1999).</p> <p>Papi M., <b>Sabatini S.</b>, Altamura M.M., Hennig L., Schafer E., Costantino P., Vittorioso P. Inactivation of the Phloem-specific Dof Zinc Finger gene DAG1 affects response to light and integrity of the Testa of <i>Arabidopsis</i> seeds. <b>Plant Physiology</b>, 128, 411-417, (2002).</p> <p><b>Sabatini S.</b>, Papi M., Bouchez D., Camilleri C., Costantino P., Vittorioso P. Identification and disruption of an <i>Arabidopsis</i> zinc finger gene controlling seed germination. <b>Gene &amp; Development</b> 14, 28-33, (2000).</p> <p>De Paolis A., <b>Sabatini S.</b>, De Pascalis L., Costantino P., Capone I.. A roIB regulatory factor belongs to a new class of single zinc finger plant proteins. <b>The Plant Journal</b> 10(2), 215-223, (1996).</p>
<p><b>Laboratory Members</b></p>	<p>Francisco Scaglia Linhares Post doc</p> <p>Raffaele dello Iorio, Phd student</p> <p>Cristina Llavata Master class student</p> <p>Emanuele Scacchi Master class student</p>