



## Technology Summary: Abscisic Acid Biosynthesis Inhibitor

### **Opportunity Statement**

There is a substantial amount of developmental activities in the domain of plant growth regulation, and a number of companies are targeting plant hormones and signaling or biosynthesis pathways.

Plant hormones are chemical compounds, produced in very small quantities that regulate plant growth, development and differentiation. There are five classes of plant hormones: Auxins, Cytokinins, Ethylene, Abscisic Acid (ABA) and Gibberellins.

Unlike the other plant hormone classes, which contain more than one chemical, ABA is a single compound. ABA, also known as dormin, helps the plant adapt to stress. The effect of ABA is seen in seed dormancy, germination and stomatal regulation. The following functions are attributed to ABA:

- Stomatal closure, reducing transpiration to prevent water loss in dry conditions
- Seed dormancy and inhibition of seed germination
- Inhibition of fruit ripening
- Decreasing enzymes involved in photosynthesis
- Arresting the synthesis of Kinetin nucleotide, a molecule that promotes cell division
- Inhibiting shoot growth without substantially affecting roots
- Inducing gene transcription, especially for proteinase inhibitors in response to wounding

ABA is a sesquiterpenoid (15-carbon), which is partially produced via the mevalonic pathway in chloroplasts and other plastids. The production of ABA is accentuated by stresses such as water loss and freezing temperatures. The biosynthesis of ABA involves a number of steps, of which the key step is catalyzed by an enzyme called epoxy-carotenoid dioxygenase (NCED). Inhibiting that enzyme would lead to inhibition of ABA synthesis, which in turn would result in regulation of the plant growth. However, no one to date has developed a patented approach for the inhibition of ABA synthesis through the inhibition of NCED.

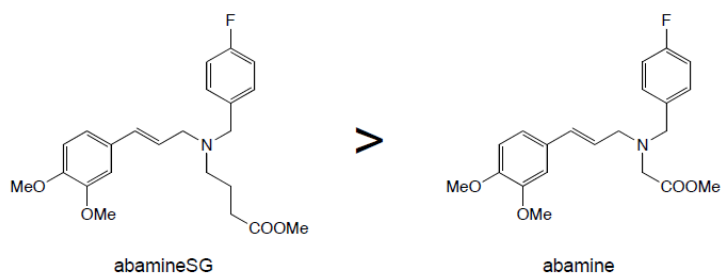
***Therefore, there is a need for a solution that will result in the effective inhibition of ABA biosynthesis.***

### **360ip's Partner Solution**

360ip's partner has developed a series of chemical compounds which function as inhibitors of biosynthesis of ABA. Of these, the most potent compounds are abamine and abamineSG. Both of these compounds inhibit ABA biosynthesis by inhibiting NCED.

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**AbamineSG is a more specific ABA biosynthesis inhibitor than abamine**



The compounds developed by the partner can be used as plant growth regulators. Such a regulator can be used for the following purposes:

- Regulation of plant elongation
- Retention of flower freshness
- Enhancement of the plant anti-stress property against stresses such as heat, dryness, coldness, diseases and the like
- Control of weeds by regulation of reproduction
- Suppression of plant retrogradation
- Control of hypertrophy of root
- Regulation of pollen growth

In addition the compounds can be used in research to study the basics of plant physiology and signaling pathways. The ABA inhibitors can be used for enhancing systemic acquired resistance to diseases in plants. Furthermore, the compounds can also be used in research to study the effect of ABA on plants. A number of methods have been used for the same; however, most of them have some drawbacks.

The partner's ABA inhibitors can be formulated as emulsions, liquids, oils, water-soluble powders, wettable powders, flowables, subtilized granules, granules, aerosols, fumigants, pastes, etc.

### **Patents**

There are two families of patents and applications assigned to 360ip's partner.

***360ip is seeking interested parties for the licensing, further development and commercialization of this technology-based solution.***

For additional information, contact:

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