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Using X-ray crystallography to understand bushfire-induced seed germination

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Passing the site of a bushfire a couple of weeks after it has burnt itself out, you may notice a mass seed germination event taking place, allowing the bush to completely come back to life. This fascinating phenomenon occurs due to compounds in bushfire smoke called karrikins, which act as triggers for seed germination.

Although we know this process occurs, we don't understand how karrikins interact with seeds or seedlings, and what the little molecular machines – known as proteins – inside individual cells do to allow a seed to germinate.

X-ray crystallography is a technique where the atomic structure of a crystal can be determined via its diffraction pattern when placed in the beam of an X-ray source. By crystallising the proteins involved in karrikin signalling and shooting them at the MX beamlines at the Australian Synchrotron, we are able to determine their structure and hence their function; allowing us to piece together a complete picture of how karrikins work.

Overall, by understanding processes that control a plant's growth and development, we have new avenues to explore in terms of finding sustainable agricultural techniques and effective methods of conservation and restoration.

Level of Expertise

Student

Presenter Gender

Woman

Pronouns

She/Her

Which facility did you use for your research

Australian Synchrotron

Students Only - Are you interested in AINSE student funding

Yes

Do you wish to take part in the Student Poster Slam

Yes

Condition of submission

Yes

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