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New techniques required to understand the by-stander effect in situ.

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The by-stander effect has been known for nearly a century under various names, of which the abscopal effect is probably the most well known. More recently the by-stander effect has received a lot of attention, and various models have been developed to assess the relative importance of the bystander effect in radiation treatment. It is clear that irradiated cells release factors that lead to alterations in the physiology of adjacent irradiated cells, both via inter-cellular junctions and through systemic factors. Most studies that have sought to identify the systemic factors and the cellular mechanisms that are responsible for the bystander effect have by necessity used in vitro systems. The purpose of this presentation is to alert the audience to the various techniques that are available to study the proteomic changes related to the bystander effect in situ. We shall pay attention to the use of MALDI-imaging to track spatial proteomic changes in tissue that have been exposed to microbeams.