Preserved and variable spatial-chemical changes of lipids across leaves in response to wounding
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- Spatiotemporal mapping of lipid changes that occur at the site of injury determine localized vs systemic lipid responses and provide lipid markers that are mechanistically linked to plant recovery.

- We used global lipidomic and multimodal MALDI-MSI approaches (15T SolariX MRMS and timsTOF fleX) on bio-replicates to better understand these processes.

Global lipidomic: LC-MS/MS

<table>
<thead>
<tr>
<th>Lipid class</th>
<th>dT=30min</th>
<th>dT=60min</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGs</td>
<td>Down</td>
<td>No change</td>
</tr>
<tr>
<td>PAs</td>
<td>Down</td>
<td>No change</td>
</tr>
<tr>
<td>PCs</td>
<td>Up</td>
<td>No change</td>
</tr>
<tr>
<td>PEs</td>
<td>Up</td>
<td>No change</td>
</tr>
<tr>
<td>SQDGs</td>
<td>Down</td>
<td>No change</td>
</tr>
<tr>
<td>TGs</td>
<td>Up/Down</td>
<td>UP/No change</td>
</tr>
</tbody>
</table>

Inter-sample and inter-segment variations

MALDI-solariX MRMS-MSI: the importance of bio-replicate imaging

Random spatial changes PC (16:0/18:3)

Preserved changes: LysoPC (16:0)

Accumulation in injured zone:
- Lipid ID
  - LysoPE (12:0)
  - LysoPA (18:1)
  - LysoPC (16:0)
  - LysoPC (18:2)
  - LysoPG (16:1)
  - LysoPL (16:0)

MALDI-timsTOF fleX MSI: Distribution (at 20 µm scale) of lipids linked to recovery at the site of injury

- Spatial modality: visualization of systematic response in wounded zone
- Co-localization analysis: hint on linolenic acid origin and PLA specificity

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