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Synthetic promoters consisting of defined *cis*-acting elements link multiple signaling pathways to probenazole-inducible system

Key words:

Probenzole, Systemic acquired resistance (SAR), *Cis*-acting element, Synthetic promoter, Chemical-inducible system

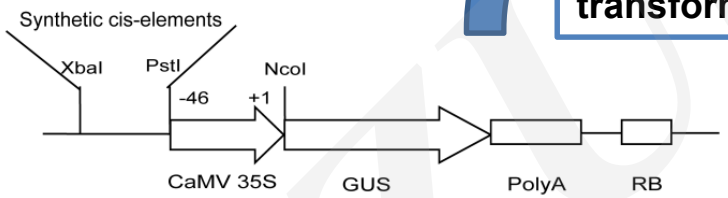
JZUSB

Research methods

SARE
GCC
JERE
HSRE
GST1
W-box

Synthesis of promoters containing defined *cis*-acting elements

Plasmid construction of synthetic promoters fused with *GUS* gene



***Arabidopsis* transformation**

PBZ



Analysis of GUS activity

Assessment of PBZ responsiveness of synthetic promoters

Preliminary identification of multiple signaling pathways triggered by PBZ

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Results

- **The SARE, an salicylic acid responsive element, responded to PBZ treatment.**
- **JERE element and GCC box , responsive to jasmonate and ethylene respectively, were found to significantly respond to PBZ induction.**
- **HSRE as well as Gst1, which are associated with HR, responded to PBZ induction.**
- **The calcium channel blocker Lanthanum III acetylacetonate hydrate (La^{3+}), a broad-range protein kinase antagonist, K252a, and a specific MAPKs inhibitor, apigenin suppressed the response of the HSRE to PBZ induction.**
- **W-box(es) alone was capable of responding to PBZ induction.**
- **The synthetic promoter (GWH) containing combinations of GST1, W-box and HSRE were shown to significantly respond to PBZ induction.**

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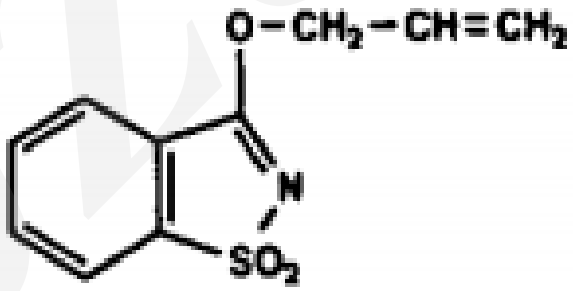
Conclusion

- **This study first proposes that PBZ is a good prospect for establishing a new chemical-inducible system which could provide a strategy to construct a novel type of transgene expression system.**

- **This study provides the possibility that, besides SA, JA, ethylene, calcium and MAPKs signaling pathways may also involved in PBZ-induced systemic acquired resistance.**



probenazole

(PBZ)

JZUS-B