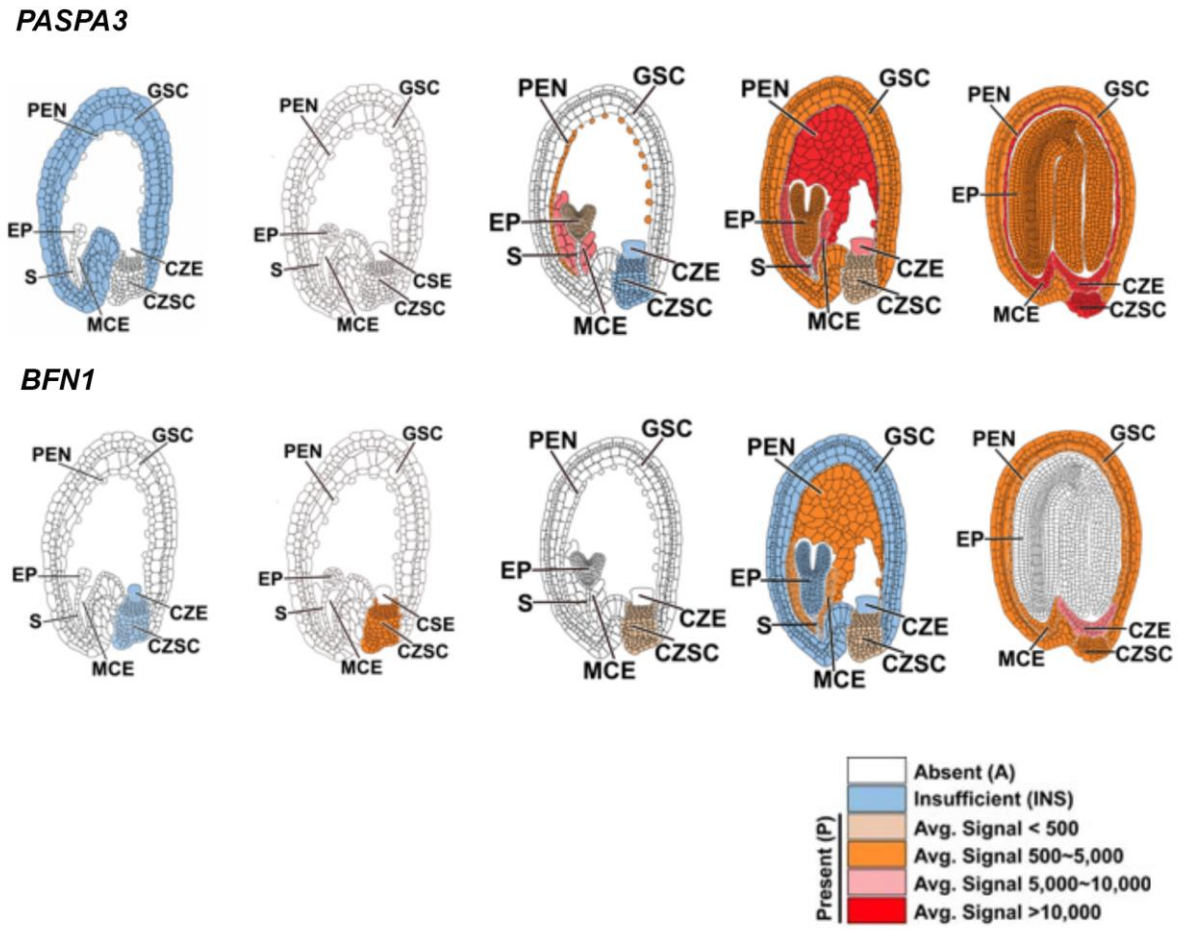
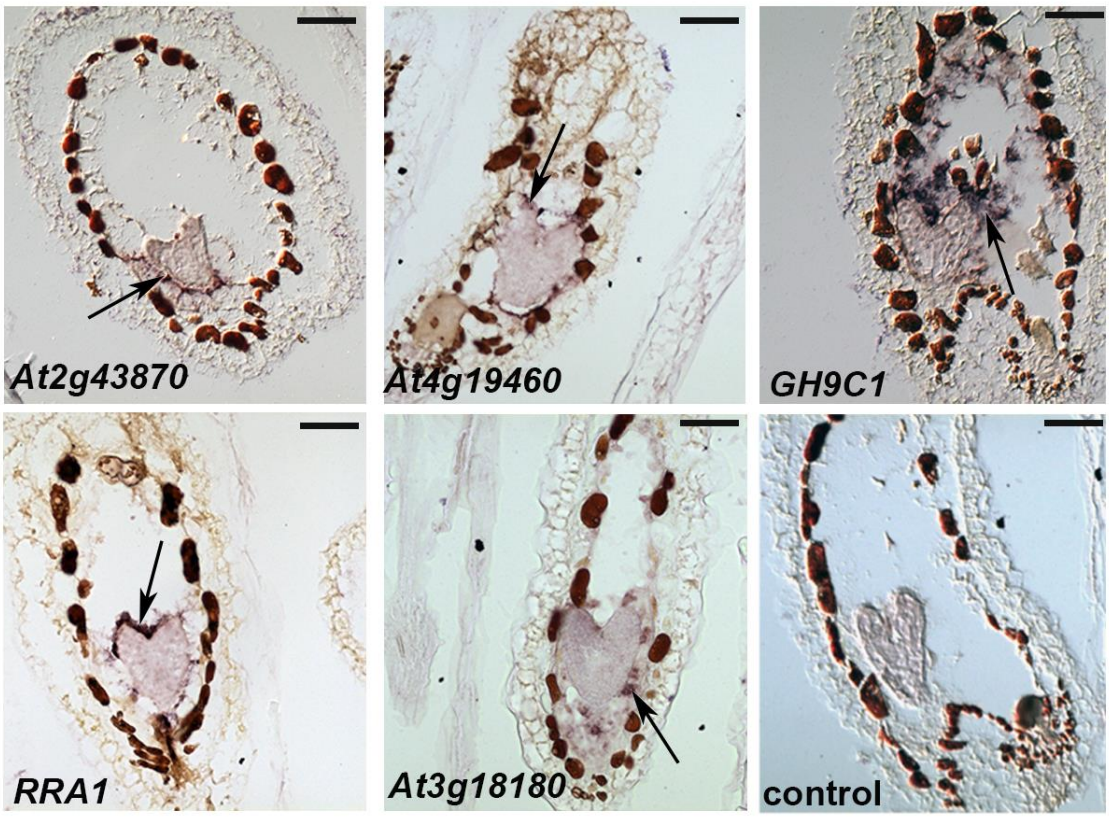


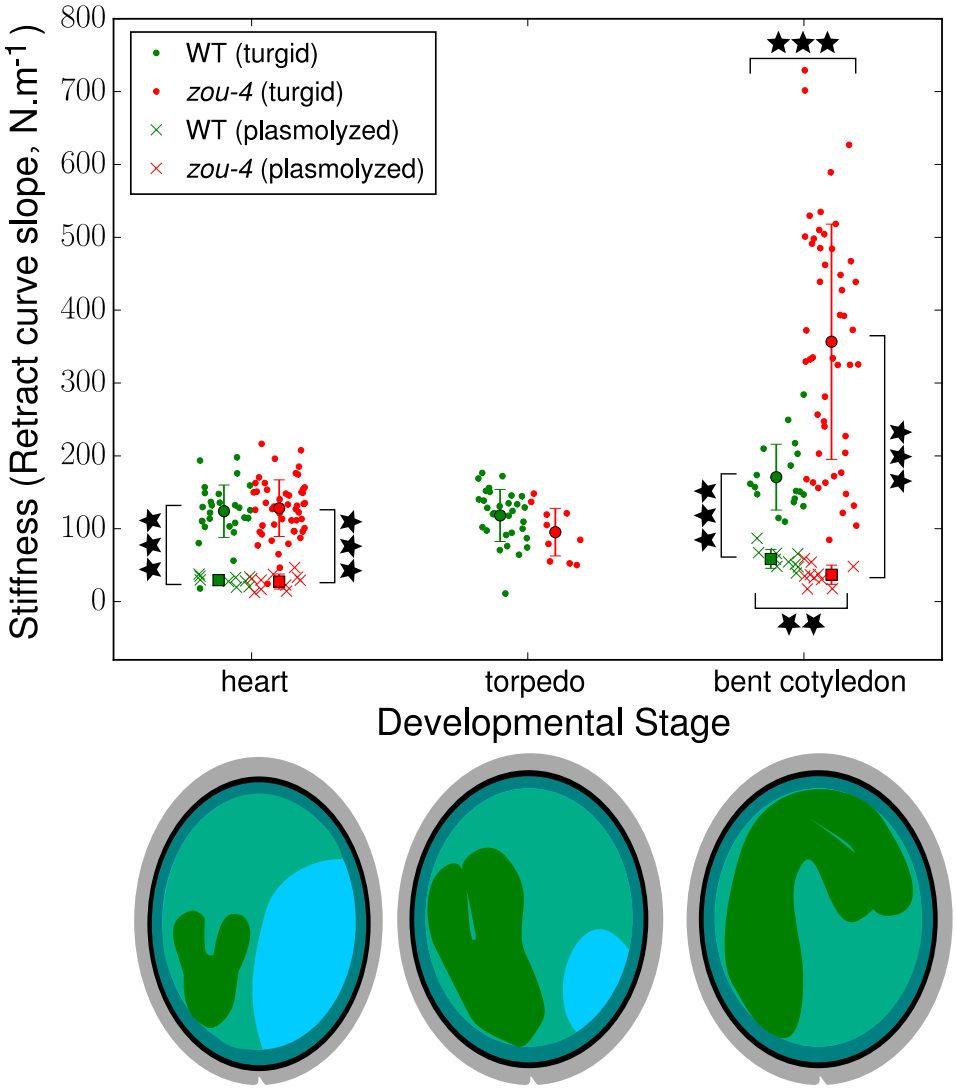
Supplementary Figure 1

Expression data for *PASPA3* and *BFN1* downloaded from the Seed Gene Network resource (http://seedgenenetwork.net/)



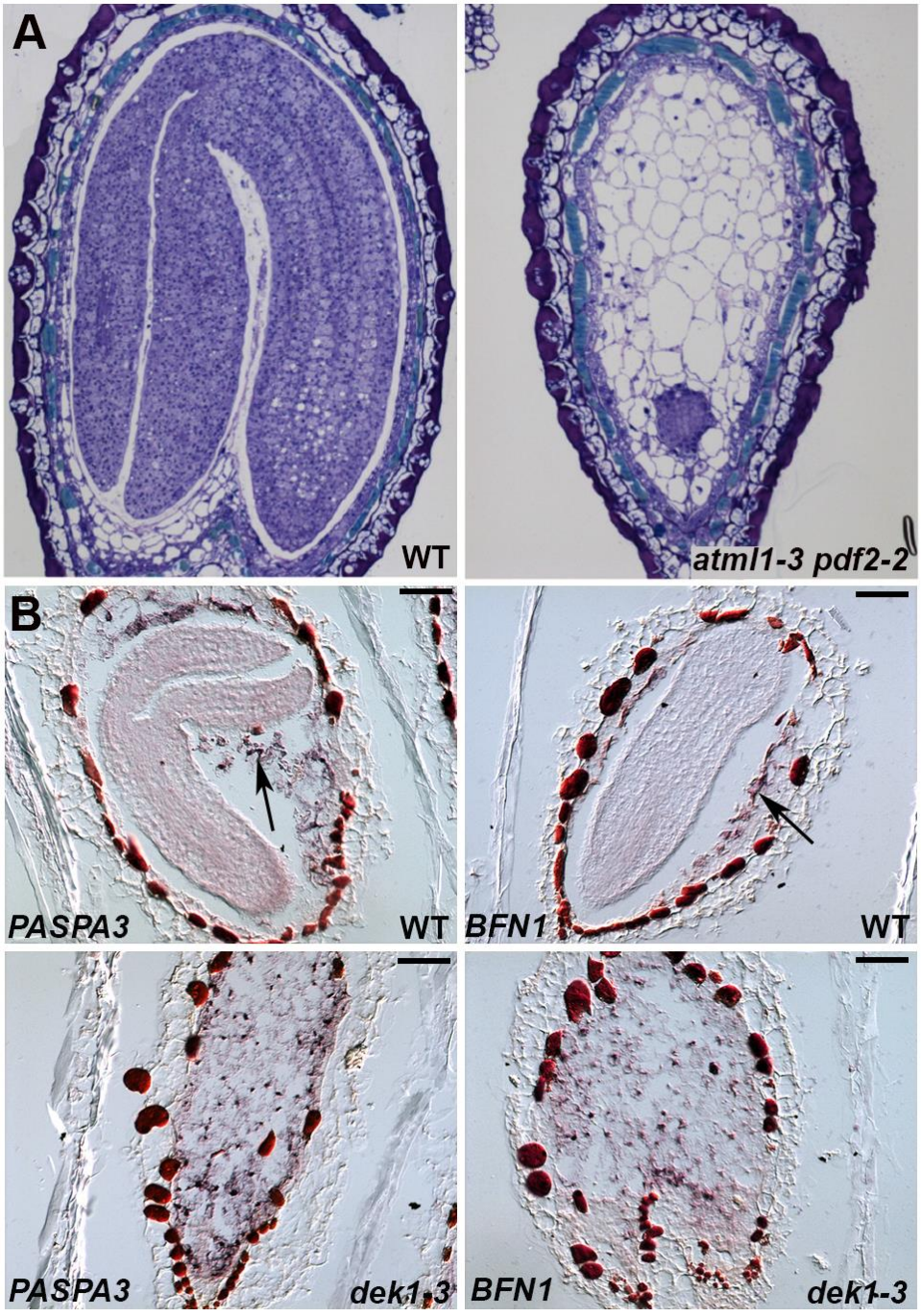
Supplementary Figure 2

Analysis of transcript accumulation from ZOU-dependent genes annotated as encoding cell wall modifiers by *in situ* hybridisation in wild-type seeds. Signal is shown as blue/black colouration (white arrows). Red/brown staining of the endothelium is a background artefact in seeds. Scale bar = 50 μm.



Supplementary Figure 3

Comparison of the apparent stiffness of wild-type and *zou-4* mutant seeds at different developmental stages. Stiffness values were extracted from the early linear retract phase of force/displacement curves obtained using a nano-indenter as described in (Beauzamy et al., Submitted). Effects of osmotic treatment (0.7M mannitol for 90 minutes) on seed stiffness are shown. Developmental stages of wild-type seeds are shown. Differences between populations were evaluated statistically using a Wilcoxon rank-sum test. **=p<0.01, ***=p<0.001. Error bars indicate standard deviation around the arithmetic mean.



Supplementary Figure 4

A) Toluidine-blue stained resin sections showing the structure of wild-type, and *atml1-3 pdf2-2* endosperm. B) Analysis of *PASPA3* and *BNF1* transcript accumulation by *in situ* hybridisation in wild-type and *dek1-3* seeds. Signal is shown as blue/black colouration (white arrows). Red/brown staining of the endothelium is a background artefact in seeds. Scale bar = 50 μm.

Table S1. Primer sequences

Primer name	Primer sequence
	AMPLIFICATION OF IN SITU PROBES
At3g18180attB1ATG	GGGGACAAGTTTGTACAAAAAAGCAGGCTCAACAATGACAAAGAAGGATATTC
At3g18180attB2STOP	GGGGACCACTTTGTACAAGAAAGCTGGGTCTTACACTGACTGATTATGCAATAG
At4g19460attB1ATG	GGGGACAAGTTTGTACAAAAAAGCAGGCTCAACAATGAATCCTTTAATTGAAC
At4g19460attB2STOP	GGGGACCACTTTGTACAAGAAAGCTGGGTCTTAAGGGTAAATACAAAATTTCTG
At1g75120attB1ATG	GGGGACAAGTTTGTACAAAAAAGCAGGCTCAACAATGGCGGTTCGTAAAGAGAAAG
At1g75120attB2STOP	GGGGACCACTTTGTACAAGAAAGCTGGGTCCTATGAACCATCACGGAAC
At2g43870attB1ATG	GGGGACAAGTTTGTACAAAAAAGCAGGCTCAACAATGGCTTCACTTCTTGTCCTC
At2g43870attB2STOP	GGGGACCACTTTGTACAAGAAAGCTGGGTCTCATAGACAATTTGGCTG
GH9C1attB1ATG	GGGGACAAGTTTGTACAAAAAAGCAGGCTCAACAATGAGGAAGTTTGGTGGATC
GH9C1attB2STOP	GGGGACCACTTTGTACAAGAAAGCTGGGTCCTAGTTGTAACTCAAAACTGAG
	Q-RT-PCR ANALYSIS
PASPA3 F	CTCTGTAAAAATGGGAACTAGGTTC
PASPA3 R	CTCTCCTTTGAAGTGCTTCGG

BFN1 F	CATCGGCTTTTAGATCATCCAC
BFN1 R	CACTTCTAAACAAAGCAGTCCAC
q18180For	CTCAGCCCTTTACCAATCGT
q18180Rev	TTCTTTGGAGATTGTAGTGTTGGT
q19460For	AAGCTTTGACGGCGGTTAT
q19460Rev	TCTCTCCGCCAATCTCTCC
qRRA1For	TCAGATAAACTCGAAAGAATGCAA
qRRA1Rev	CATCTTGCTTGCCATTAACGTA
q43870For	AGCTTCTTTATGGGATTGTAAAAAGT
q43870Rev	TGAGCTCTGAAATCCTATTGTCG
qGH9C1F	GGCCTATTCGCTAAACTCTATGGAG
qGH9C1R	ATTTGTGCACCTGATTGCTTTG
qRGP3L	ACACCATTGATGATGATTGCTT
qRGP3R	TGTTAAAGAAATGCGGAGTTGA