Nuclear Localization Signal (NLS) is found in other BED-NLR families

Triticum aestivum

Populus trichocarpa

Panax Notoginseng

Yr7 NLS in functional in N. benthamiana

Generating YFP-tagged truncations in Yr7 with/without its NLS to test for localization in N. benthamiana

Yr7

Is NLS functional?

NLS in Yr7 is functional in N. benthamiana

Yr7-BED: SPWEHFTITETTIDGKRSKAKC

Yr5-BED: SPWEHFTITETTIDGKRSKAKC

YrSP-BED: SPWEHFTITETTIDGKRSKAKC

BED domain does not, or not solely, govern specificity to PST

BED-Yr5/BED-YrSP: identical

BED-Yr7/BED-Yr5: one AA change

Yr7, Yr5 and YrSP have different resistance spectra to Puccinia striiformis f.sp tritici

BED domain is required for resistance: one point mutation in BED domain is sufficient to disable resistance response in Yr7

MutRenSeq enables NLR cloning in hexaploid wheat

We used a similar approach to clone Yr5 and YrSP

Marchal et al., 2018 Nature Plants

Yr7, Yr5 and YrSP encode BED-NLRs

Based on sequence analysis and fine-mapping, Yr5 and YrSP are likely to be alleles and closely linked to Yr7

Identifying Yr7 loss of function mutants

NLR-genes capture, enrichment and sequencing

Sequence-based analysis to identify candidates (MutantHunter, Steuernagel et al., 2016)

Each mutant lines carries an independent mutation in a contig = candidate

Questions to be addressed in future work

Do BED domains integrated in NLRs share features with BED domains from other proteins?

Is BED domain guarding an effector target?

Is NLS important for Yr7-mediated response in wheat?