Genome assembly and characterization of a complex zfBED-NLR gene-containing disease resistance locus in Carolina Gold Select rice with Nanopore sequencing

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Golden hulled grains of heirloom rice cultivar Carolina Gold Select

In addition to its culinary and cultural importance, Carolina Gold Select rice is resistant to strains of two important disease-causing bacteria. A high quality genome sequence was generated by combining long and short-read DNA sequencing technologies. All of the more than 400 disease resistance genes in Carolina Gold Select were identified and compared with those in other sequenced rice genomes. A candidate gene for the bacterial disease resistance was identified and discovered to have unusual features found in a small number of disease resistance genes across rice and several related species. The Carolina Gold Select genome is the first of a tropical japonica variety and represents a valuable resource for harnessing disease resistance as well as other useful traits.

Image Credit: Kay Rentschler.