

## 3'-cADPR and 2'-cADPR, novel signalling molecules in plants and bacteria

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### 3'-cADPR (aka v2-cADPR / 1''-3'-gcADPR / 1''-3' glycocyclic ADPR)

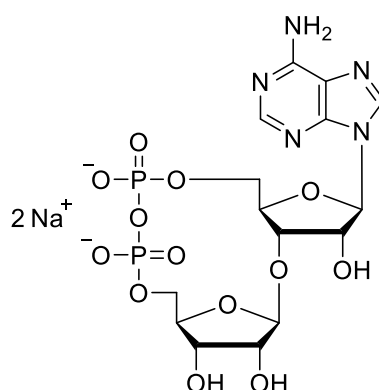
Two recent studies reveal 1''-3' glycocyclic ADPR (3'-cADPR, Biolog Cat. No. C 404) as a novel signalling molecule involved in immune responses in plants and bacteria (1, 2).

In bacteria, the Thois defence system consists of ThsA and ThsB and inhibits bacteriophage (phage) infection and spread by an abortive infection mechanism (3). Upon infection, ThsB, a TIR-domain containing protein, produces 3'-cADPR, which in turn activates ThsA, a potent NADase, depleting the cell of NAD<sup>+</sup>, leading to cell growth arrest and death of the infected cells (1, 2, 3). In response, certain phages have evolved Thois anti-defence (Tad) proteins Tad1 and Tad2, which are molecular sponges that bind and sequester 3'-cADPR to prevent ThsA activation (1, 4).

In plants, 3'-cADPR has been shown to be produced by HopAM1 in *Pseudomonas syringae* (5). Production of 3'-cADPR by HopAM1 has been linked to suppression of plant immunity, implicating 3'-cADPR in roles beyond bacterial immunity (2).

### Cat. No. C 404

3'-cADPR /  
v2-cADPR /  
1''-3'-gcADPR



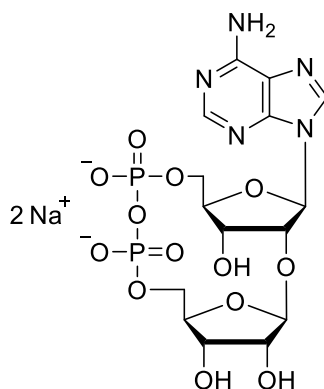
## 2'-cADPR (aka v-cADPR / 1''-2'-gcADPR / 1''-2' glycocyclic ADPR)

1''-2' glycocyclic ADPR (2'-cADPR, Biolog Cat. No. C 406) is an isomer of 3'-cADPR, a novel signalling molecule involved in plant and bacterial immunity (1, 2).

2'-cADPR has been shown to be produced by TIR-domain containing proteins in both plants and bacteria, suggesting that 2'-cADPR may also play a role in immune signalling in an analogous way to 3'-cADPR (1, 2, 6). Similarly, phage proteins Thoeris anti-defence (Tad) Tad1 and Tad2, which inhibit the bacterial Thoeris system by binding 3'-cADPR, also bind 2'-cADPR with high affinity (1, 4).

### Cat. No. C 406

2'-cADPR /  
v-cADPR /  
1''-2'-gcADPR



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