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| **C:\Users\hatfull lab\Desktop\2011 Teacher Workshop 6-9\Graphics and Logos\500px-UofPittsburgh_Seal.svg.png** | Phagehunting Program | C:\Users\hatfull lab\Desktop\2011 Teacher Workshop 6-9\Graphics and Logos\ForDarkBackgrounds-Logo.png |
| Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:PreparationPNG.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:IsolationPNG2.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:PurificationPNG.png C:\Users\Owner\Desktop\Protocol\picture\AmplificationWorkFlowgray.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:ExtractionPNG.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:CharacterizationPNG.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:SequencingPNG.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:AnnotationPNG.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:PhamerationPNG.png Macintosh HD:Users:Enoch:Desktop:New Protocols:Logos and Graphics:Workflow:FurtherDiscoveryPNG.png |

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**Bps gene 22 :**

Mutations in this gene have expanded host range

**Rosebush genes 32 and 42**

Mutations in these genes have expanded host range

**Cluster N integrases and repressors, Brujita Integrase and repressor Cluster J capsids:**

Identified through N-terminal sequencing

**Giles non‐essential genes identified through BRED**