

Bardet-Biedl Syndrome Gene Sequencing Panel (Test #251)

Brief Description of Clinical Features: Bardet-Biedl Syndrome (BBS) (OMIM# 209900) is a pleiotropic disorder characterized by retinal degeneration, obesity, post-axial polydactyly, cognitive impairment, hypogenitalism and renal and cardiovascular anomalies (Green et al. N Engl J Med 32:1002-1009, 1989; Elbedour et al. Am J Med Genet. 52:164-169, 1994).

BBS clinical features overlap with a group of diseases known as ciliopathies, which includes Meckel-Gruber Syndrome (MKS) (OMIM 249000), Joubert Syndrome (OMIM 213300), Bardet-Biedl Syndrome (BBS), Nephronophthisis (OMIM 256100), Senior-Loken Syndrome (SLSN) (OMIM 609294) and Leber Congenital Amaurosis (LCA). These disorders may represent a phenotypic continuum of a single clinical entity (Hildebrandt et al. J Am Soc Nephrol 20:23-35, 2009).

Genetics: BBS is primarily inherited as an autosomal recessive disorder, although complex inheritance has been reported in a few BBS families (Katsanis et al. Science 293:2256-2259, 2001). Similar to other ciliopathies, BBS exhibits locus heterogeneity; at least 13 BBS genes have been identified (*BBS1*, *BBS2*, *BBS3*, *BBS4*, *BBS5*, *MKKS/BBS6*, *BBS7*, *TTC8/BBS8*, *BBS9*, *BBS10*, *TRIM32/BBS11*, *BBS12*, and *SDCCAG8/BBS16*) (Tobin and Beales, Genet Med 11:386-402, 2009). In addition, hypomorphic mutations in two Meckel-Gruber syndrome genes (*MKSI* and *CEP290*) were reported to be associated with BBS, representing *BBS13* and *BBS14* respectively (Leitch et al. Nat Genet 40:443-448, 2008).

Description of This Particular Test: The following genes will be tested in the order specified in the Table below, unless a different order is requested by the client. Testing is accomplished by amplifying and sequencing the coding exons and ~50 bp of adjacent non-coding sequence. See also the individual Test Descriptions for each gene. As indicated, we will sequence one (Test #100, \$190) or two (Test #200, \$340) exons in family members of patients with known mutations or to confirm research results.

Reference Sequences:

Gene	Disease	Percentage of reported BBS mutation	Genomic: NC	mRNA: NM	Protein: NP	CCDS
<i>BBS1</i>	BBS	~23%	000011.9	024649.4	078925.3	8142.1
<i>BBS10</i>	BBS	~20%	000012.11	024685.3	078961.3	9014.2
<i>BBS2</i>	BBS	~8%	000016.9	031885.3	114091.3	32451.
<i>MKKS/BBS6</i>	BBS	~6%	000020.10	018848.2	061336.1	13111.
<i>BBS12</i>	BBS	~5%	000004.11	152618.2	689831.2	3728.1
<i>BBS4</i>	BBS	~3%	000015.9	033028.3	149017.2	10246.
<i>BBS7</i>	BBS	~2%	000004.11	176824.1	789794.1	3724.1
<i>TTC8/BBS8</i>	BBS	~2%	000014.8	144596.2	653197.2	32137.
<i>BBS5</i>	BBS	~2%	000002.11	152384.2	689597.1	2233.1
<i>ARL6/BBS3</i>	BBS	~1%	000003.11	032146.3	115522.1	2928.1
<i>BBS9</i>	BBS	~1%	000007.13	198428.2	940820.1	43566.
<i>TRIM32/BBS11</i>	BBS	<1%	000009.11	012210.3	036342.2	6817.1
<i>SDCCAG8</i>	SLSN7 / BBS	<1%	000001.10	006642.3	006633.1	31075.

Indication for Testing: Candidates for this test are patients with symptoms consistent with BBS.

Sensitivity of Test: Sensitivity for BBS testing is at least 70% overall.

Turnaround Time: Maximum of 100 days.

Specimen Requirements: See page 4 of Requisition Form.

CPT Codes and Prices

Codes	<i>BBS1</i>	<i>BBS10</i>	<i>BBS2</i>	<i>MKKS</i>	<i>BBS12</i>	<i>BBS4</i>	<i>BBS7</i>	<i>TTC8</i>	<i>BBS5</i>	<i>ARL6</i>	<i>BBS9</i>	<i>TRIM32</i>	<i>SDCCAG8</i>	Panel
83890	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30
83891	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40
83898	\$250	\$120	\$ 260	\$ 140	\$120	\$260	\$300	\$240	\$200	\$140	\$340	\$120	\$ 320	\$2980
83904	\$370	\$170	\$380	\$ 220	\$170	\$380	\$440	\$360	\$310	\$200	\$510	\$170	\$ 470	\$4460
83894	\$ 80	\$ 40	\$ 70	\$ 50	\$ 40	\$ 70	\$ 80	\$ 70	\$ 60	\$ 40	\$ 80	\$ 40	\$ 60	\$ 630
83912	\$120	\$ 90	\$ 110	\$ 100	\$ 90	\$ 110	\$ 130	\$ 110	\$ 100	\$ 90	\$ 130	\$ 90	\$ 120	\$ 390
Totals:	\$890	\$490	\$890	\$580	\$490	\$890	\$1020	\$850	\$740	\$540	\$1130	\$490	\$1040	\$8530*

***When seven or more of the genes are tested, a 15% discount will apply to the total cost of the tests.**

Accreditation: CLIA ID:52D1027685 (expires 1/18/13) CAP ID:7185561, AU ID:1407125 (expires 12/20/12)

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