

**Table S3. Pairwise Spearman's rank correlation coefficients ( $\rho$ ) between estimates of  $B$  from different BGS models\***

	$M_{LN,CO+GC,StdMut}$	$M_{LN,CO,StdMut}$	$M_{G,CO+GC,StdMut}$	$M_{G,CO,StdMut}$	$M_{LN,CO+GC,LowMut}$	$M_{LN,CO,LowMut}$	$M_{G,CO+GC,LowMut}$
$M_{LN,CO,StdMut}$	0.98784						
$M_{G,CO+GC,StdMut}$	0.99792	0.98569					
$M_{G,CO,StdMut}$	0.99132	0.99717	0.99303				
$M_{LN,CO+GC,LowMut}$	0.99999	0.98760	0.99782	0.99105			
$M_{LN,CO,LowMut}$	0.98798	0.99998	0.98579	0.99713	0.98775		
$M_{G,CO+GC,LowMut}$	0.99796	0.98560	0.99999	0.99293	0.99786	0.98570	
$M_{G,CO,LowMut}$	0.99141	0.99715	0.99310	0.99999	0.99114	0.99714	0.99300

\* See Materials and Methods for detailed description of the eight BGS models.  $P < 1 \times 10^{-12}$  in all cases.