

# Efficacy of Belimumab Across Multiple Organ Domains in Systemic Lupus Erythematosus: Results of a Large Integrated Analysis

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## Background

- Systemic lupus erythematosus (SLE) affects multiple organs, most commonly those of the musculoskeletal, mucocutaneous, constitutional, and renal systems<sup>1</sup>
- Belimumab, an anti-B-lymphocyte stimulator antibody, has demonstrated efficacy in Phase 3 trials,<sup>2-5</sup> improved renal outcomes in active nephritis,<sup>6</sup> and reduced organ damage progression<sup>7</sup>
- Belimumab is approved for the treatment of patients with active SLE and adult patients with active lupus nephritis<sup>8,9</sup>

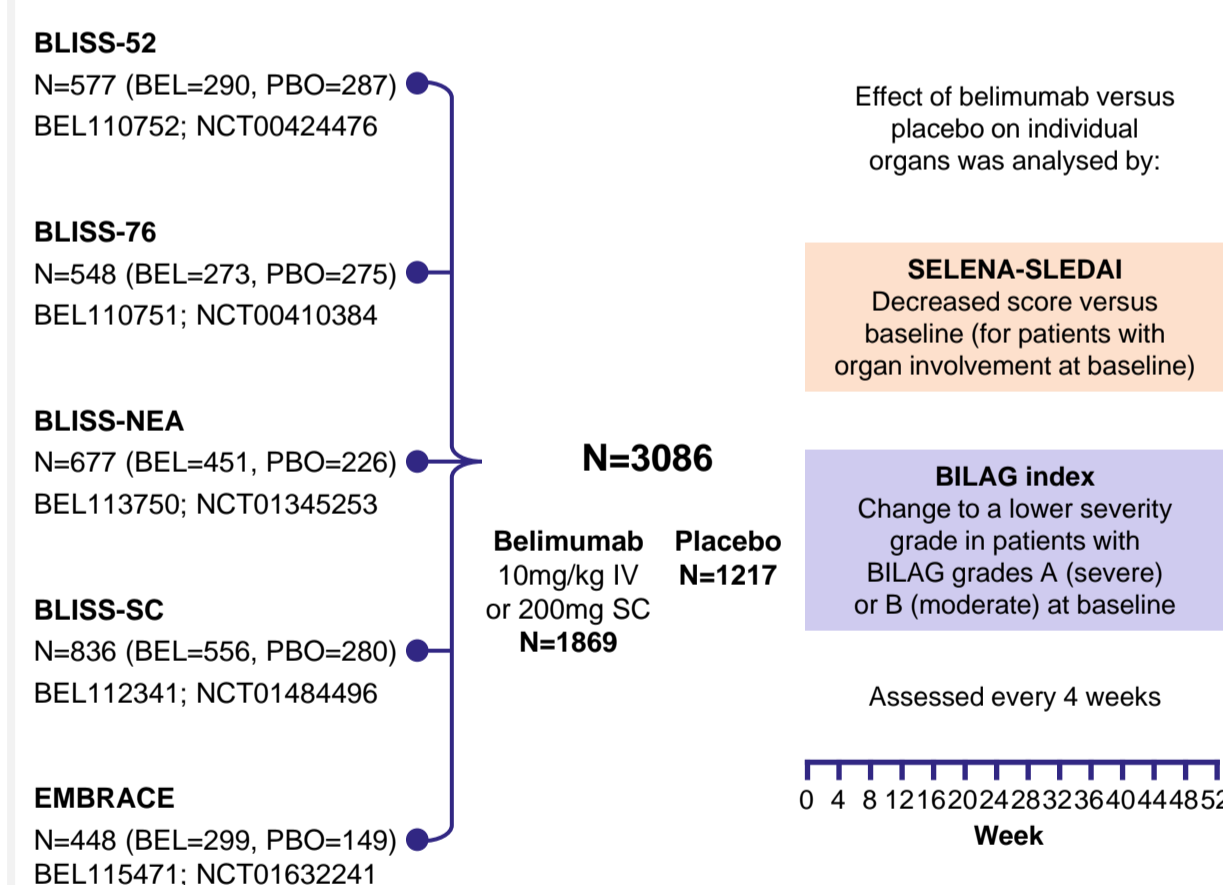
## Objective

This pooled analysis evaluated the effects of belimumab on SLE disease activity in different organs

## Methods

- This was a pooled analysis of 5 Phase 3, randomized, placebo-controlled belimumab clinical trials: BLISS-52, BLISS-76, BLISS-NEA, BLISS-SC, and EMBRACE (Figure 1)

Figure 1. Study design



BEL, belimumab; BILAG, British Isles Lupus Assessment Group; BLISS, Study of Belimumab in Subjects with SLE; EMBRACE, Efficacy and safety of belimumab in patients of Black Race with SLE, IV, intravenous; PBO, placebo; SC, subcutaneous; NEA, North East Asia; SELENA-SLEDAI, Safety of Estrogens in Lupus Erythematosus National Assessment-SLE Disease Activity Index

## Statistical analysis

- Each evaluation reported percentage of responders and Fisher's exact test compared response proportions between treatment groups at Week 52

## Disclosures

JTM has received grant/research support from AstraZeneca, Bristol Myers Squibb, and GSK; and has worked as a paid consultant for AbbVie, Alexion, Alpine, Amgen, Astellas, AstraZeneca, Aurinia, Biogen, Bristol Myers Squibb/Celgene, Eli Lilly, EMD Serono, Genentech, GSK, Immupharma, Janssen, Provention, Remegen, Sanofi, and UCB. YT has received grant/research support for AbbVie, Asahi-Kasei, Chugai, Daiichi-Sankyo, Eisai, Mitsubishi-Tanabe, and Takeda; has worked as a paid consultant for AbbVie, Ayumi, Daiichi-Sankyo, Eli Lilly, GSK, Sanofi, and Taisho; and has been a paid speaker for AbbVie, Asahi-Kasei, Astellas, Bristol Myers Squibb, Chugai, Daiichi-Sankyo, Eisai, Eli Lilly, Gilead,

## Results

### Baseline characteristics

- The proportion of female patients (~94%) and the mean age (~37 years) were similar for both treatment groups (Figure 2)

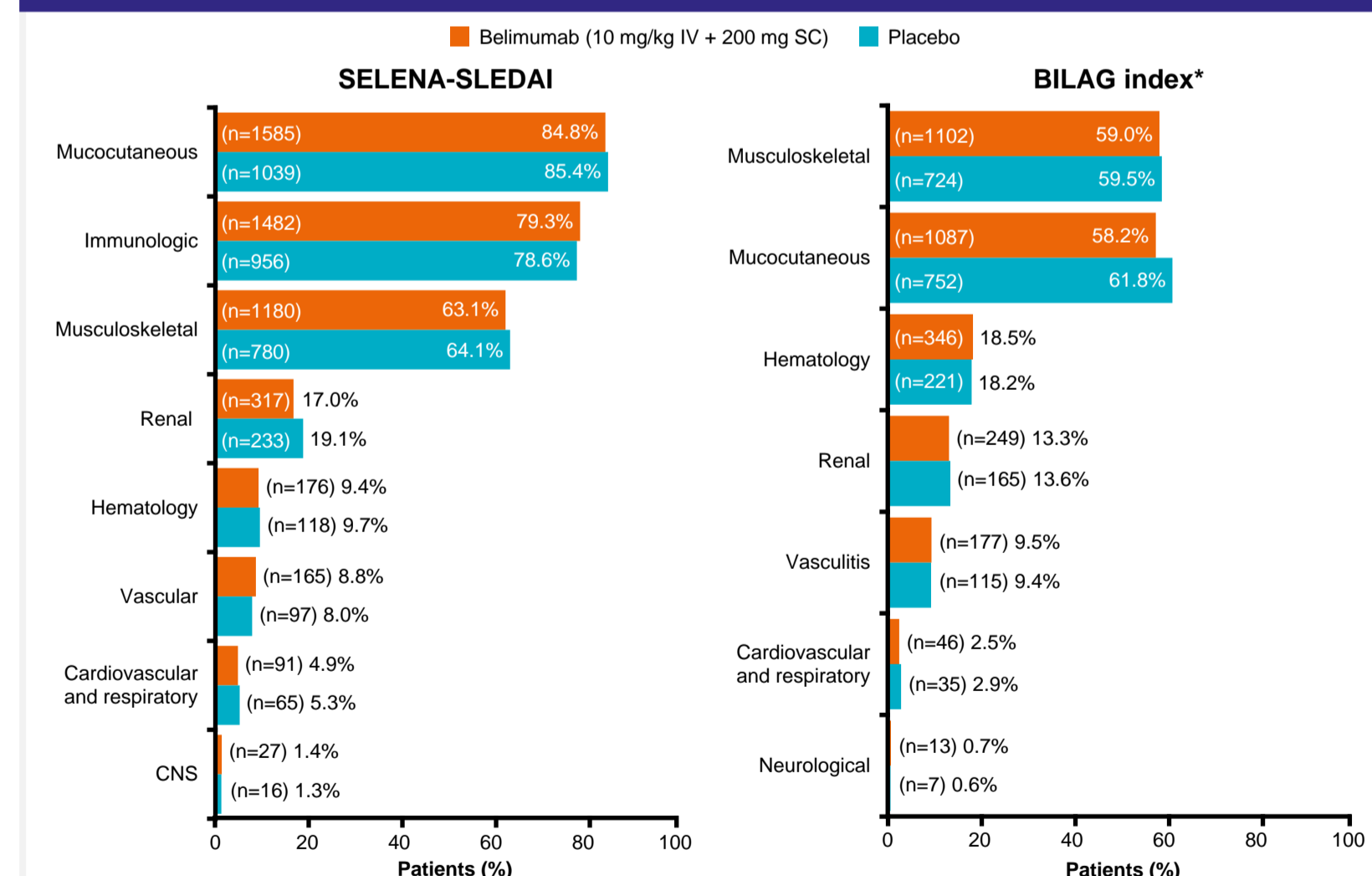
Figure 2. Patient demographics and baseline characteristics

	Belimumab 10 mg/kg IV + 200 mg SC (N=1869)	Placebo (N=1217)		Belimumab 10 mg/kg IV + 200 mg SC (N=1869)	Placebo (N=1217)
Female, n (%)	1769 (94.6)	1144 (94.0)	SLE disease duration (years), mean (SD) <sup>†</sup>	6.4 (6.3)	6.6 (6.5)
Age (years),* mean (SD)	36.7 (11.4)	37.4 (12.0)	BILAG index organ involvement, <sup>‡</sup> n (%)		
Race, <sup>†</sup> n (%)			At least 1A or 2B	1139 (60.9)	778 (63.9)
Asian	697 (37.3)	405 (33.3)	At least 1A	257 (13.8)	180 (14.8)
White	596 (31.9)	436 (35.8)	At least 1B	1622 (86.8)	1070 (87.9)
Black African ancestry	405 (21.7)	229 (18.8)	No A or B	176 (9.4)	108 (8.9)
American Indian or Alaskan Native <sup>†</sup>	169 (9.0)	146 (12.0)	SELENA-SLEDAI score, mean (SD)	10.0 (3.6)	10.0 (3.6)
Native Hawaiian or Other Pacific Islander	2 (0.1)	1 (<0.1)	SELENA-SLEDAI score severity, n (%)		
Multiracial	16 (0.9)	13 (1.1)	≤9	835 (44.7)	537 (44.1)
			≥10	1034 (55.3)	680 (55.9)

\*Age was imputed when full date of birth was not available; <sup>†</sup>patients who checked more than 1 race category were counted under individual race category according to the minority rule as well as the multiracial category; <sup>‡</sup>patients having origins in any of the original peoples of North, Central, or South America; <sup>§</sup>duration defined as (screening date/treatment start date - SLE diagnosis date + 1)/365.25; <sup>¶</sup>patients may be included in more than 1 category. SD, standard deviation

- At baseline, the most commonly affected organs were mucocutaneous, musculoskeletal, immunologic, hematologic and renal (Figure 3)

Figure 3. Organ involvement at baseline

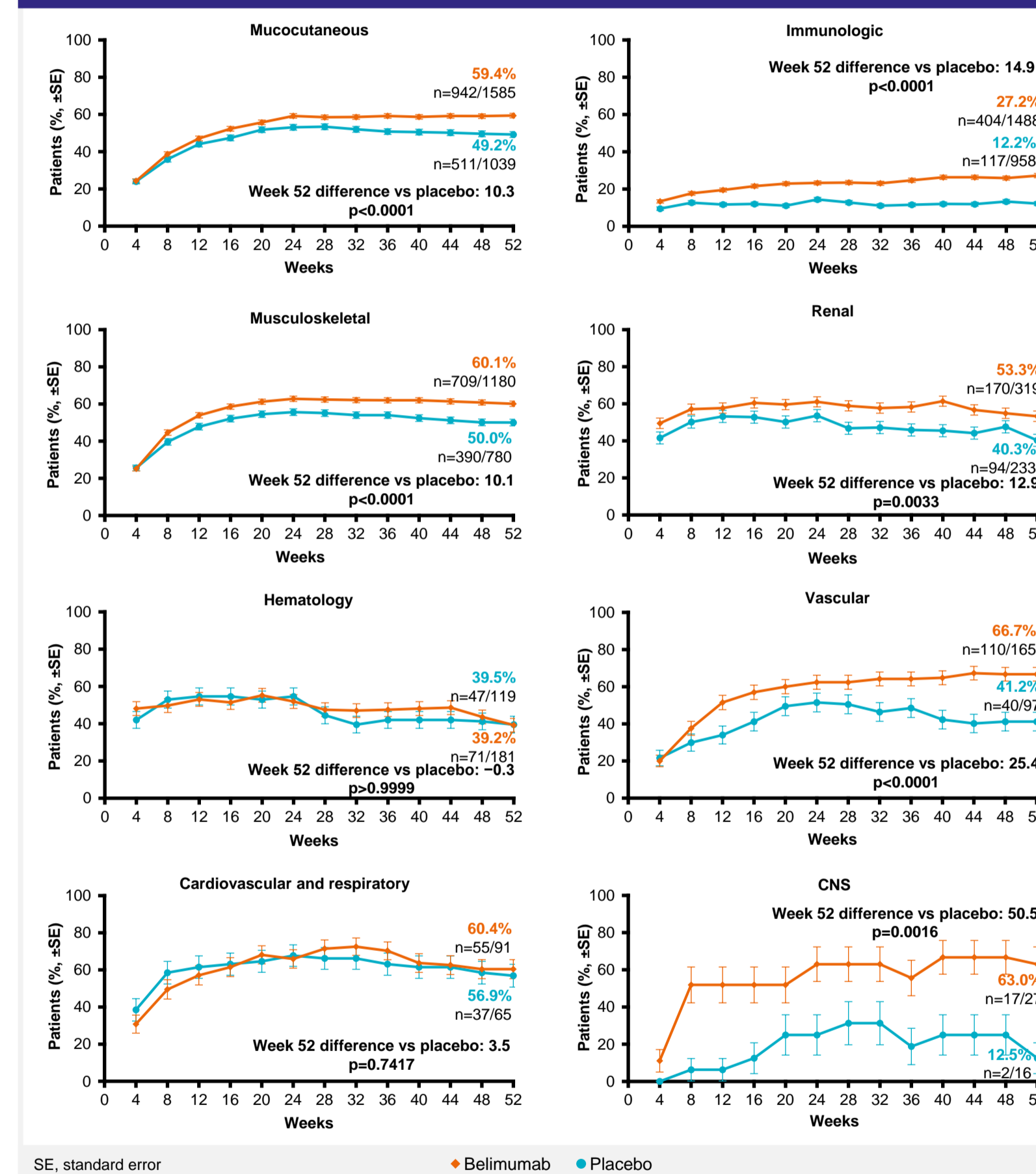


\*For each BILAG index domain, only patients with category A and B are presented (A=severe disease activity, B=moderate disease activity). CNS, central nervous system

### Changes in organ involvement by SELENA-SLEDAI (Figure 4)

- Significantly more patients receiving belimumab demonstrated an improvement in immunologic, mucocutaneous, musculoskeletal, vascular, and renal domains at Week 52 versus placebo
- Improvements were observably greater between belimumab and placebo patients before Week 12
- No significant improvements were observed between patients receiving belimumab versus placebo in the cardiovascular and respiratory, and the hematologic domain

Figure 4. Proportion of patients responding by SELENA-SLEDAI in each organ over 52 weeks



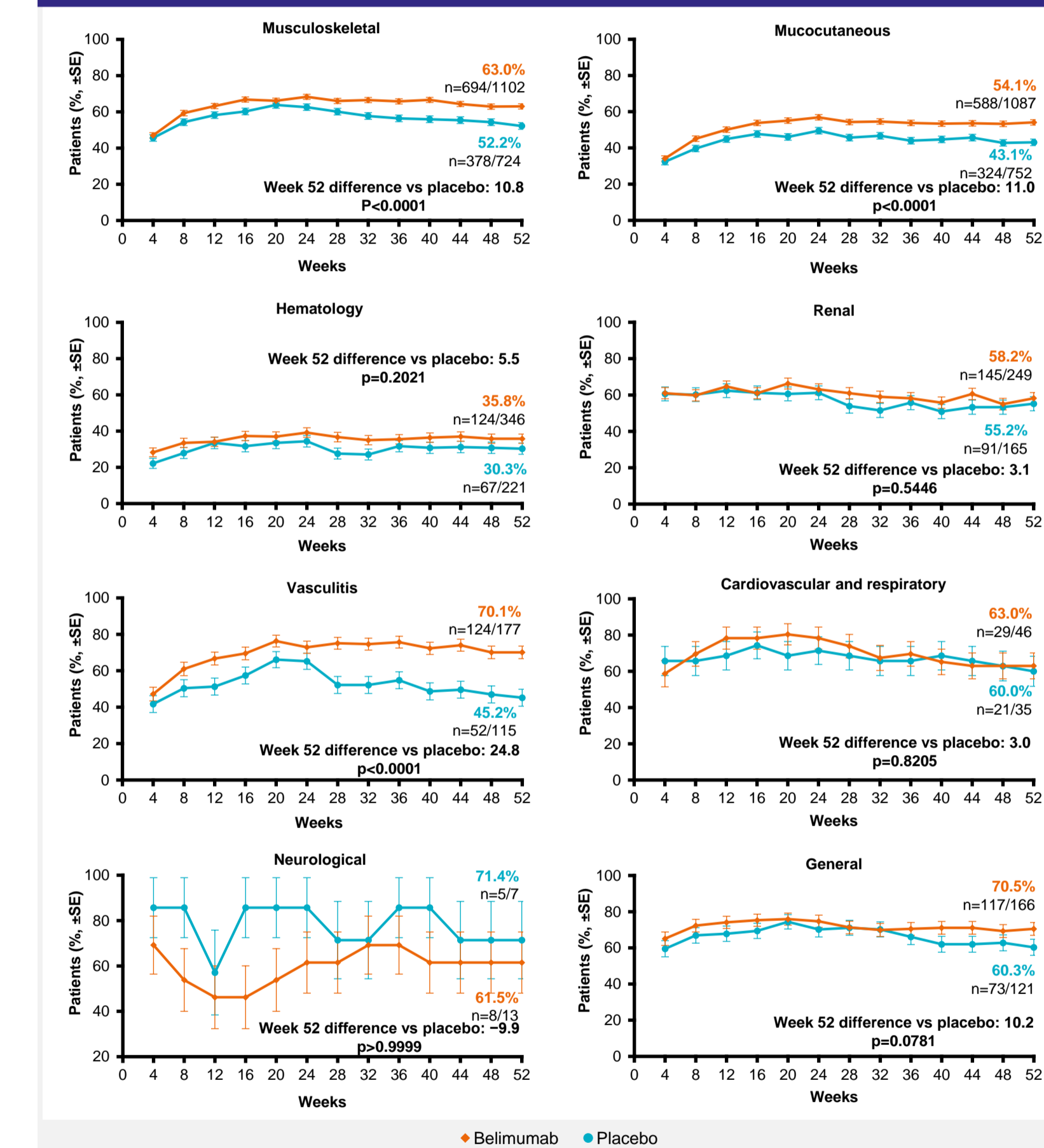
## Conclusions

- Belimumab demonstrated significant improvements in the commonly observed musculoskeletal and mucocutaneous organs amongst other organs at Week 52 versus placebo, when analyzed by both SELENA-SLEDAI and the BILAG index

### Changes in organ involvement by BILAG index (Figure 5)

- Significantly more patients receiving belimumab versus placebo had improvements in mucocutaneous, musculoskeletal, and vasculitis domains at Week 52
- An observable difference between belimumab and placebo patients typically occurred before Week 24
- No significant improvements were observed between patients receiving belimumab versus placebo in hematologic, renal, cardiovascular and respiratory, neurological, and general domains

Figure 5. Proportion of patients responding by BILAG index in each organ over 52 weeks



- Improvements with SELENA-SLEDAI were typically established before Week 12, and with BILAG index by Week 24, and were subsequently maintained until Week 52
- The results of this pooled analysis support the efficacy of belimumab across the most common organ manifestations in SLE

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