P5-59 — Using CP-GEP model (Merlin Assay) to stratify melanoma patients on long-term survival in a multi-continent cohort study (A-495)

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Introduction

Sentinel lymph node biopsy (SLNB) is an important tool for staging clinically node negative patients with cutaneous melanoma (CM). Having a negative SLN indicates a favorable prognosis, however many of these early-stage CM patients will relapse or even die of melanoma. Risk stratification of these early-stage patients is warranted. Previously Eggermont (2020), Mulder (2022) and Amaral (2023) showed that the CP-GEP model (Merlin Assay) can risk stratify CM patients in terms of risk of recurrence and melanoma specific survival.

Aim: To validate CP-GEP's ability to risk stratify melanoma patients based on long-term survival in a three-continent study.

Methods

- 522 clinically node negative stage I-III CM patients that underwent SLNB during 2007-2017 at Peter MacCallum Cancer Centre and Alfred Health (MRV, Victoria, Australia), Heidelberg University (Germany) or University of Louisville (USA).
- CP-GEP combines Breslow thickness and patient's age at diagnosis with the expression of eight genes from the primary tumor and provides a binary output: High Risk or Low Risk.
- Primary endpoints: 5-year Relapse-Free Survival (RFS), Distant Metastasis-Free Survival (DMFS), Melanoma-Specific Survival (MSS) and Overall Survival (OS).
  Median follow-up time was 72 months.

Table 1. Patient characteristics

Variable	Level	Cohort N=522
Gender	Female	224 (43%)
	Male	298 (57%)
Age (years)	Median [1QR, 3QR]	59 (47, 68)
Breslow thickness (mm)	Median [1QR, 3QR]	1.90 (1.20, 3.00)
Ulceration	Absent	331 (63%)
	Present	145 (28%)
	Unknown	46 (9%)
SLNB outcome	Negative	361 (69%)
	Positive	161 (31%)
CP-GEP	Low Risk	159 (31%)
	High Risk	363 (69%)
Stages	IA	58 (11%)
	IB	120 (23%)
	IIA	81 (15%)
	IIB	58 (11%)
	IIC	24 (5%)
	III	161 (31%)
	Unknown	20 (4%)
Biopsy Location	Head neck	41 (8%)
	Trunk	202 (39%)
	Upper extremities	105 (20%)
	Lower extremities	136 (26%)
	Other	38 (7%)
Histologic type	Superficial spreading	255 (49%)
	Nodular	129 (25%)
	Other	89 (17%)
	Unknown	49 (9%)

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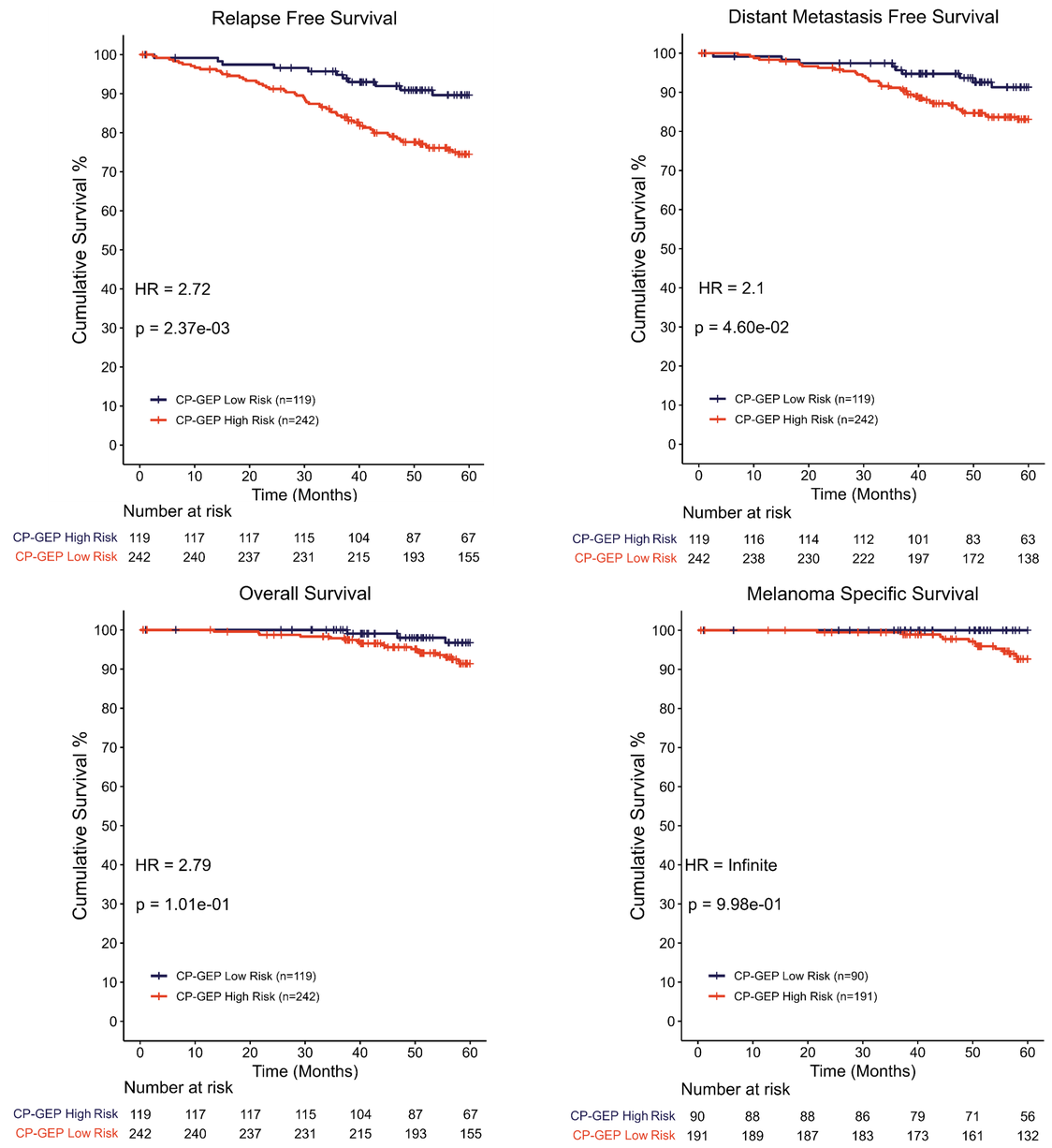
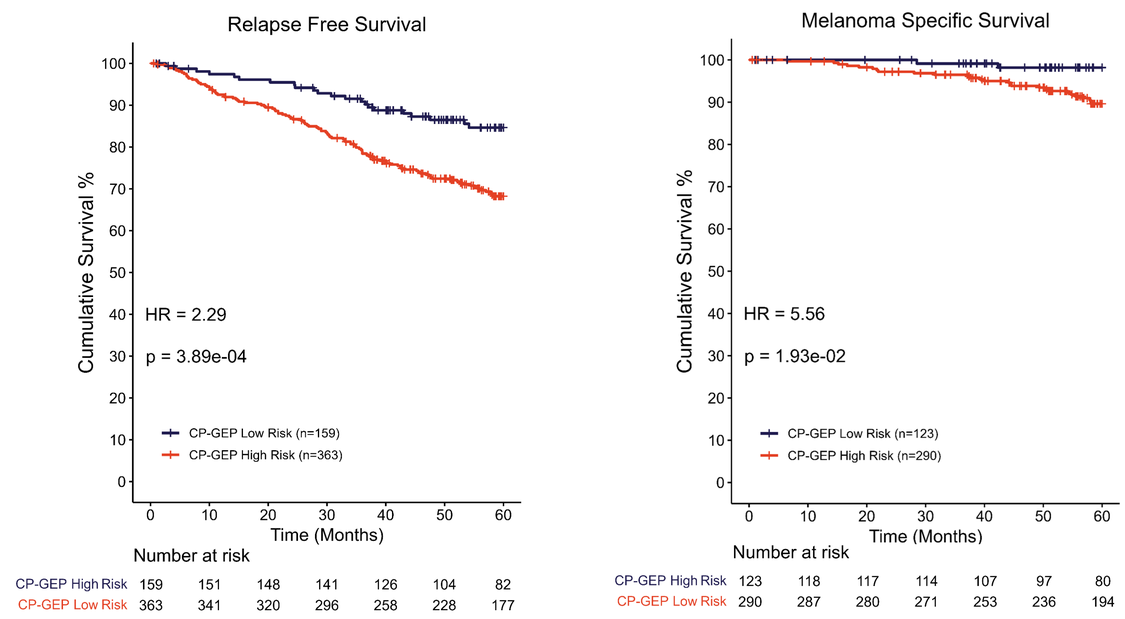
Stage I/II CM patients stratified by CP-GEP



	N	5-years RFS Events	%	95%CI	5-years DMFS Events	%	95%CI	5-years OS Events	%	95%CI	5-years MSS Events	%	95%CI
Complete cohort	361*	69	79.3	[75-83]	47	85.7	[81-89]	21	93	[90-95]	12	94.8	[91-97]
CP-GEP Low Risk	119*	11	89.6	[82-94]	9	91.3	[84-95]	3	96.7	[90-99]	0	100	[100-100]
CP-GEP High Risk	242*	58	74.5	[68-80]	38	83.1	[78-87]	18	91.4	[87-95]	12	92.6	[87-96]

Figure 1. Kaplan-Meier curves showing 5-year RFS, DMFS, OS and MSS of SLNB negative (stage I-II) CM patients stratified by CP-GEP (**High Risk** and **Low Risk**). *For MSS, N=281, 90, and 191 for complete cohort, CP-GEP Low Risk and CP-GEP High Risk, respectively.

CP-GEP risk stratifies stage I-III CM patients



	N	5-years RFS Events	%	95%CI	5-years DMFS Events	%	95%CI	5-years OS Events	%	95%CI	5-years MSS Events	%	95%CI
Complete cohort	522*	131	73.1	[66-77]	83	82.7	[79-86]	42	90.8	[88-93]	29	92.0	[89-94]
CP-GEP Low Risk	159*	22	84.6	[78-90]	19	86.5	[80-91]	5	96.2	[91-98]	2	98.2	[93-100]
CP-GEP High Risk	363*	109	68.2	[63-73]	64	81.1	[76-85]	37	88.5	[85-92]	27	89.6	[85-93]

Figure 2. Kaplan-Meier curves showing 5-year RFS and MSS of patients diagnosed with Stage I-III CM stratified by CP-GEP (**High Risk** and **Low Risk**). *For MSS, N=413, 123, and 290 for complete cohort, CP-GEP Low Risk and CP-GEP High Risk, respectively.

Conclusion: CP-GEP can risk stratify CM patients by their long-term survival across all clinical stages

➢ **CP-GEP Low Risk patients have a favorable long-term survival, while CP-GEP High Risk patients have a high risk of recurrence**

➢ **CP-GEP may be used to support clinical decision-making in melanoma clinical care**