

Appendix-2

Table 1A

	Authors	Cohort	Biomarker	Tool	Result
Cancer	1. Lutgen-dorf et al., [48]	Ovarian cancer patients n=56	MMP-2, MMP-9, and VEGF	CES-D, PSS, IES, LES, POMS-SF, SPS	1) Depressed patients - Elevated MMP-9
			<i>In vitro</i> : norepinephrine (NE) and cortisol		2) Patients with high social support - Reduced MMP-9
					3) <i>In vitro</i> : Stress hormones like norepinephrine and cortisol enhance MMP-9 production
	2. Davies et al., 2015	Ovarian cancer patients n= 353	Tumor norepinephrine	CES-D, IES, POMS-SF, PWBS, FACT	1) High level of eudaimonic well-being were found to be associated with low tumour NE
		Epinephrine and dopamine below detection levels		2) Positive effect and psychological distress were unrelated to tumour NE	
3. Hoyt et al., 2003	Prostate cancer patients undergone radical treatment n=41		TNF-RII, CRP, and IL-6.	Emotional approach coping	1) Emotional processing predicted lower IL-6, sTNF-RII and CRp
					2) Emotional expression was associated with higher levels of sTNF-RII
Childhood adversities	4. Carli et al., [10]	Male prisoners n=763	5HTTLPR genotype in mouth wash	1. Psychiatric screening, 2. Data on crime and disciplinary reports, 3. CTQ, 4.CD-RISC, 5.HDRS	1) The 5- HTTLPR genotype did not influence resilience and depressive severity , However, a significant interaction was observed between 5-HTTLPR and childhood traumas on both resilience and depressive severity.
					2) Among individuals exposed to high levels of childhood traumas, carriers of the 1-allele in 5-HTTLPR had low resilience scores and more severe depressive symptoms than s/s homozygous (contrasting with much evidence supporting s-allele as conferring higher risk for psychopathology in subjects exposed to current and stressful events.)
	5. Das et al., [17]	A representative population age 30-34 years n=1148	Buccal epithelial cells, DRD4-exIII-VNTR genotype	1) CD-RISC, 2) Questionnaire on experience of childhood adversities, 3) measure of Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS). 4) Functional status of the most common 4 r and 7 r alleles	1) we observed an interactive effect of DRD4 genotype and CA (b = 0.132; p = 0.003) on resilience despite no main effect of the genotype when effects of age, gender and education were controlled for.
				2) The 7-repeat allele appears to protect against the adverse effect of CA since the decline in resilience associated with increased adversity was evident only in individuals without the 7-repeat allele.	
				3) Resilience was also significantly associated with approach-/ avoidance-related personality measures (behavioral inhibition/activation system; BIS/BAS) measures and an interactive effect of DRD4-exIII-VNTR genotype and CA on BAS was observed.	

War	6. Telch et al., [63]	Army soldiers, prospective cohort n=133	5HTTLPR genotype in saliva	PTSD-checklist, CES-D, combat experience log, DSMIV	1) There is an association between the 5-HTTLPR genotype, level of exposure to war zone stressors, and symptoms of PTSD, depression and anxiety among soldiers.
					2) War zone stress reactions (PTSD, depression, and anxiety) showed a sig. inverted U-pattern in their growth curves.
					3) The 5-HTTLPR moderates, but does not predict as a main effect, the impact of stress on risk for depression and anxiety.
					4) Soldiers reporting more severe war zone stressors also reported higher levels of PTSD, depression, and anxiety.
					5) The main effect was moderated by 5-HTTLPR genotype. S' carriers responded to increasing levels of war zone stressors with increasingly greater stress reactions.
	7. Graham et al., [31]	War veterans; n=41 with mild traumatic brain injury (TBI) and n=26 controls without TBI exposure.	influence of 5-HTTLPR genotype	CD-RISC, CRIS, TBIdx, PTSD, CES-D	1) The presence of a TBI is associated with lower resilience and more perceived social limitations.
					2) The 5-HTTLPR S'S' genotype is associated with more resilience in the context of fewer perceived limitations when compared to S'L' and L'L' genotypes.
3) It was not a dose related effect of the S' allele.					
4) TBI status and 5-HTTLPR genotype showed mild moderating effect on the relationship between resilience and perceived support.					
Stress	8. Sandvik et al., [59]	Military personnel n=22 (pre-selected to be able to handle stressful situations)	Dried blood, IL-6, IL-12, IL-4, IL-10, & neuro-peptide-Y.	DRS-15-R	1) Increase in IL-6 levels with increased stress.
					2) Unbalanced group more stress reactive,
					3) Unbalance group, Increase in anti-inflammatory cytokines (IL-4 and IL-10)
					4) The unbalanced group suppressed proinflammatory cytokine (IL-12)
					5) The unbalanced group lower neuropeptide-Y levels
	9. Cole et al., [13]	Adolescents n=64	IL6 promoter, IL6 -174G allele	1. Composite measure of adolescents' SES, 2. Adult domestic role, 3. Stress	1) A protective effect of the polymorphism in the human IL-6 promoter was identified in 17-19-year-old adolescents confronting socio-economic adversity.
					2) The IL6-174G allele sensitizes inflammatory biology to socioenvironmental conditions.
					3) Genetic vulnerability interacts with social conditions to influence gene expression.
	16. Aschbacher et al., [1]	post-menopausal women caring for spouses with dementia n= 25, and control women with healthy spouses n=23	1) Cortisol, 8-Hydroxyguanosine (8-oxoG), 2) 8-hydroxy-2'-deoxyguanosine (8-OHdG),	1. PSS, 2. PANAS, 3. TSST, 4. Health behaviors related to oxidative damage (physical activity, alcohol consumption, BMI), 5. Medical histories at baseline	1) Women under chronic stress had higher 8-oxoG, oxidative damage for preparing for the stress task.
					2) Heightened anticipatory cortisol reactivity mediates the relationship between perceived stress and elevated oxidative stress damage, in chronically stressed women.
3) Chronic stress exposure promotes oxidative damage through sustained activation of the HPA-axis.					
4) Manageable levels of life stress may enhance psychobiological resilience to oxidative stress (eustress model)					

High impact trauma	10. Cowdin et al., [16]	Adults with trauma exposure. NoPTSD diagnosis n=22 and PTSD diagnosis n=2	REM sleep periods	1) The Clinician Administered PTSD Scale (CAPS), 2) The Structural Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders (SCID), 3) Polysomnography (PSG), 4) qualitative EEG (qEEG) 5) Analysis of the theta frequency in frontal leads	Right frontal theta activity during REM sleep may distinguish resilient individuals from those with PTSD. This may be a marker of affective memory processing capacities.
	14. Gill et al., [29]	Pre-menopausal women 18-45 yrs, n=77	blood IL-6, CRP and lipid concentrations.	LIFE EVENT CHECK-LIST, clinical interview, sf36	IL-6 and VRP higher in PTSD
					2) Higher concentrations of inflammatory biomarkers are linked to declines in HRQOL.
Psychological resilience in a non-trauma setting	11. O'Hara et al., [53]	Older adults (55-100 years), caucasian n=99	5HTTLPR genotype in blood	CD-RISC-10, successful aging questionnaire, SF-36, CAST	1) No sig. association between the 5-HTTLPR s allele and resilience. 2) S allele carriers had worse cognition and less successful aging. 3) The impact of 5-HTTLPR s allele on stress-related outcomes may attenuate with older age.
	15. Rana et al., [56]	Older adults n=1152	SNPs	CD-RISC, life orientation test, CES-D	The MAOA SNP rs6323 showed possible assoc. with both optimism and resilience. Resilience showed possible assoc. with IL10 as well as FGG.
	12. Petros et al., [55]	Non-clinical and community population n=196, saliva sample n=32	Saliva samples; cortisol, DHEA-S	CD-RISC, GSE, LOT-R, STAI-Form-Y, CES-D-10, WHO-Wellbeing index, Berlin social support scale, life stress inventory	1) Both resilience and social support reduce the risk of depression. 2) Resilience was linked to the ratio of DHEA-S and cortisol as a putative marker of resilience. 3) Increasing age was associated with lower DHEA-S/cortisol ratio and salivary DHEA-S levels.
	13. Stein et al., [60]	Students, n=423	5HTTLPR genotype	CD-RISC-10, NEO-FFI, personality, inventory, beck depression inventory, childhood trauma questionnaire	1) A greater number of "S" copies was associated with lower resilience. Compared to being homozygous for the "l" allele.

Table 1B

	RESILIENCE verktyg		
CD-RISC	Connor-Davidson Resilience Scale		
DRS-15-R	norwegian adaptation of dispositional resilience scale		
NEO-FFI	NEO-Personality Inventory-Revised	60	
Analysverktyg för reaktioner			
CES-D	Center for Epidemiological Studies-depression scale. 20-items	20 items	Radloff L 1977
PSS	The Perceived Stress Scale: 14-item	14- item	cohen et al. 1983
IES	The Impact of Event Scale	15-item	Horowitz et al. 1979
LES	The Life Experience Survey		Saranson et al. 1978
POMS-SF	The Profile of Mood States Short form	37- item	Curran et al. 1995, Sacham 1983
SPS	The Social Provisisons Scale	24-it3m	Rusell 1984
PWBS	the Ryff Psychological Well-Being Scales		
FACT	the Functional Assessment of Cancer Therapy		
EAC	Emotional Approach Coping	4+4 item (4 emotional processing, 4 emotionasl expression)	Stanton et al. 1994, 2000a,b

CTQ	Childhood Trauma Questionnaire	28	
HDRS	Hamilton Depression Rating Scale		
CA	Childhood Adversity		
SES	Socio Economic Status		
CAST	Cognitive assessment screeningTest		
GES	Generalised Self-efficacy scale	10-item	
LOT-R	life orientation Test - Revised	10-items	
STAI-Form-Y	trait anxiety scale	10-items	
BDI	Beck Depression Inventory	21	
PANAS	Positive and Negative Affect Schedule		
TSST	The Trier Social Stress Task		