

Table 2: Non-emotional cognition - Biomarkers of treatment response on mood symptoms

Author	Paradigm	Measure	Patients	N	Study design	Treatment group	Finding
Cléry-Melin et al. (2017)	The domains and their composite tests were as follows: Processing speed, attentive flexibility, planning, and task shifting (TMT A-B); attention (d2 neurocognitive drawing test)	Behaviour	MDD	508 TGs	Open-label uncontrolled	Atypical antidepressant (melatonin and serotonin receptor antagonist) agomelatine (8 weeks)	At baseline, responders showed higher attention performance.
Crane et al. (2017)	Parametric Go/No-go task	fMRI and behaviour	MDD	29 TGs	Open-label uncontrolled	SSRI escitalopram or SNRI duloxetine (10 weeks)	At baseline, responders showed more unsuccessful inhibition (i.e., more performance errors) as well as less recruitment (i.e. lower activation) of brain areas important for cognitive control and/or interference resolution, including the ACC, left VMPFC and right VLPFC

Dunkin et al. (2000)	The domains and their composite tests were as follows: Basic Attention (WAIS-R Digit Span); Information Processing Speed: (TMT-A, STWC, WAIS-R Digit Symbol); Language (Boston Naming Test); Visuo-perceptual Abilities (WAIS-R Block Design, Rey-Osterreith Complex Figure Copy, Benton Facial Recognition Test); Verbal Memory (RAVLT); Nonverbal Memory (WMS-R Visual Reproduction, Rey-Osterreith Complex Figure-3-min delayed recall); Executive Functions (WCST, Auditory Consonant Trigrams (ACT), COWAT, Stroop Task-Part C, and TMT-B)	Behaviour	MDD	22 TGs	RCT double blind, placebo-controlled	SSRI fluoxetine (8 weeks)	At baseline, responders showed higher performance on measures of executive functioning compared to non-responders.
Furtado et al. (2012)	WTAR, BVMT, RAVLT, TMT A-B, WAIS III Digit-Span subtest, COWAT	fMRI and behaviour	MDD	42 TGs, 46 HCs	Non-RCT (only HC group)	rTMS (6 weeks)	There was no significant difference in baseline neurocognitive profiles and medial temporal lobe (MTL) volumes between eventual treatment responders and non-responders.

Gudayol-Ferre et al. (2010)	The domains and their composite tests were as follows: Premorbid intellectual functioning (WAIS III vocabulary subtest); Working memory (WAIS III Digit span, SWM); Verbal learning and memory (RAVLT); Visual learning and memory (PAL, DMS); Mental and motor processing speed (STWC); Attention (RVP, WAIS III Digit span); Executive function, response inhibition (Stroop test colors); Executive function, fluency (COWAT); Executive functions; attentional set-shifting (ID/ED); Executive function, planning (SOC)	Behaviour	MDD	64 TGs	Open-label uncontrolled	SSRI fluoxetine (4 weeks)	At baseline, responders showed a combination of a good performance in variables of attention and low performance in planning.
Hernández-Ribas et al. (2013)	Word-generation task (based on COWAT)	fMRI and behaviour	MDD	21 TGs/PGs, 15 HCs	RCT double blind, placebo-controlled	rTMS (15 sessions)	At baseline, responders displayed a combination of lower activity in perigenual, medial OFC and middle frontal cortices, and greater activation in the ventral-caudal putamen during a word-generation task compared to non-responders

Herrere-Guzman et al. (2008)	The domains and their composite tests were as follows: Premorbid intellectual functioning: (WAIS III vocabulary subtest); Short term and Working memory (WAIS III Digit span, DMS); Verbal learning and memory (RAVLT); Visual learning and memory (PRM, PAL, Spatial Recognition Memory); Mental and motor processing speed (MTS Visual Search, Reaction Time); Sustained Attention (RVP); Executive function, Response inhibition (STWC); Executive function, Verbal fluency (COWAT); Executive function, Attention shifting (ID/ED); Executive function, Strategy (SWM); Executive functions, Planning (SOC).	Behaviour	MDD	20 TGs	Open-label uncontrolled	Atypical antidepressant (norepinephrine–dopamine reuptake inhibitor) bupropion (8 weeks)	At baseline, responders showed deficits in visual memory and mental processing speed.
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Hoy et al. (2012)	Digit Span Forward & Backward, Hopkins Verbal Learning Test (HVLT), Brief Visuospatial Memory Test (BVMT), Controlled Oral Word Association Test (COWAT)	Behaviour	BD & MDD	137 TGs	Open-label uncontrolled	rTMS (4-6 weeks)	Initial improvements in performance on immediate visuospatial memory were significantly related to eventual treatment response, with visuospatial improvement being a significant predictor of degree of eventual improvement in a near significant regression model.
Kampf-Sherf et al. (2004)	TMT A-B, Purdue Pegboard, Rey-Osterrieth Complex Figure Test, RAVLT, BVRT, WAIS-R Arithmetic+Block Design+Similarities subtests, Hooper Visual Organization Test, Visual Frequency of Occurrence Test.	Behaviour	MDD	55 TGs	Open-label uncontrolled	SSRI (6 weeks)	At baseline, responders were characterized by better functioning in “simple” tasks (simple and fast responses, and/or little information processing is required) and by worse functioning in “complex” tasks (cognitive tasks that require patients to wait and/or to process large amounts of information) compared to nonresponders.

Langenecker et al. (2007)	Parametric Go/No-go task	fMRI and behaviour	MDD	15 TGs, 22 HCs	Non-RCT (only HC group)	SSRI citalopram (10 weeks)	At baseline, responders showed increased rostral ACC activation during incorrect inhibitory trials (commissions).
Raes et al. (2008)	The domains and their composite tests were as follows: Memory specificity (Autobiographical memory test); Executive control (Letter-Number Sequencing test).	Behaviour	BD & UD	25 TGs	Open-label uncontrolled	ECT (9-12 sessions)	The greater the proportion of OGMs retrieved before treatment, the greater the increase (or the smaller the decrease) in depression scores after treatment stops.
Taylor et al. (2006)	The domains and their composite tests were as follows: psychomotor speed (COWAT, STWC, Wisconsin card sorting task, WAIS III Digit symbol & Block design & Digit Span & Vocabulary)	Behaviour	UD	37 TGs	RCT open-label	SSRI fluoxetine (12 weeks)	At baseline, responders displayed better mental processing speed, significantly predicted by better performance on verbal fluency (using COWAT FAS).
Walsh et al. (2007)	N-back verbal working memory	fMRI and behaviour	MDD	20 TGs	Open-label uncontrolled	SSRI fluoxetine (8 weeks)	At baseline, responders showed lower linear load-response (decreased activity) during a verbal working memory task in the DACC.