Technology/	Novel Patient-Centered Diagnostic Indicators for Substance Use			
Title	Disorders			
Subtitle				
Technology	Biotechnology	Dev	vice/Diagnostics	
Туре	Pharmaceutical	Oth	ers: Diagnosis indicators	
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Link	<u>TWI783453B.pdf</u>			
	Most diagnoses of substance use disorder involve analyzing the			
	concentrations of blood substances or their metabolites to			
	determine if a patient is using illegal substances. However, patients			
	often use more than one substance, making it unlikely that all			
	substances can be analyzed in a single test.			
	This technology offers plasma biomarkers that reflect the physical			
	status of patients who regularly use substances like opioids,			
	ketamine, amphetamines, and alcohol. These bioindicators include			
	neurofilament light chain (NfL), Nectin-4, C-C motif chemokine			
	ligand 11 (CCL11), myeloperoxidase (MPO), caspase-10, A			
	disintegrin and metalloproteinase domain-containing protein 10			
	(ADAM10), and interleukin-7 (IL-7). These bioindicators can indicate			
	brain neuronal injury caused by substance use, continually use of			
Technology	substances like heroin, ketamine, or alcohol, the severity of chronic			
Description	stress, or tissue damage resulting from long-term, multiple			
	substance use disorders.			
	These diagnostic indicators can help both patients and caregivers			
	monitor the physical condition of individuals with substance use			
	disorders, facilitating the development of personalized treatment			
	plans. Additionally, these biomarkers can assist caregivers in			
	assessing whether the current management or treatment is			
	effectively improving the patient's condition.			
	These diagnostic biomarkers could also assist individuals without			
	substance use disorders in monitoring their physical health on a daily			
	basis, leading to improved management and observation of overall			
	health in the general population.			

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Property	TWI783453B		
Key Publications	<ul> <li>Representative publications:</li> <li>✓ Plasma Neurofilament Light Chain Levels are associated with Delirium Tremens in Patients with Alcohol Use Disorder: A Pilot Study. Progress in Neuro-Psychopharmacology &amp; Biological Psychiatry. 2025 January; 136 (2025) 111189.</li> </ul>		
	<ul> <li>Changes of neurofilament light chain in patients with alcohol dependence following withdrawal and the genetic effect from ALDH2 Polymorphism. European Archives of Psychiatry and Clinical Neuroscience. 2024 Mar;274(2):423-432.</li> </ul>		
	<ul> <li>Ketamine-dependent patients with persistent psychosis have higher neurofilament light chain levels than patients with schizophrenia. Asian Journal of Psychiatry. 2024 Oct;100:104167.</li> </ul>		
	<ul> <li>Procollagen type 1 N-terminal propeptide, neurofilament light chain, proinflammatory cytokines, and cognitive function in bipolar and major depressive disorders: An exploratory study of brain– bone axis and systemic inflammation. Journal of Psychiatric Research. 2023 Feb;158:403-408.</li> </ul>		
	<ul> <li>Comorbidity of ketamine dependence with major depressive disorder increases the vulnerability to neuroaxonal pathology. Journal of Psychiatric Research. 2023 Feb;158:360-364.</li> </ul>		
	<ul> <li>Increase in plasma CCL11 (Eotaxin-1) in patients with alcohol dependence and changes during detoxification. Brain Behav Immun. 2022 Jan; 99:83-90.</li> </ul>		
	<ul> <li>Neurofilament light chain is a novel biomarker for major depression and related executive dysfunction. Int J Neuropsychopharmacol. 2022 Feb; 25(2):99-105</li> </ul>		
	<ul> <li>Increased nectin-4 levels in chronic ketamine abusers and the relationship with lower urinary tract symptoms. Environ Toxicol Pharmacol. 2021 Oct; 87:103714.</li> </ul>		
	<ul> <li>Neurofilament light chain as novel blood biomarker of disturbed neuroaxonal integrity in patients with ketamine dependence.</li> <li>World J Biol Psychiatry. 2021 Nov; 22(9):713-721.</li> </ul>		
	<ul> <li>✓ Adhesion molecules as potential novel biomarkers for opioid dependence. Curr Pharm Des. 2020 Jan;26(2):253-259.</li> </ul>		
	✓ Genetic variants in NECTIN4 encoding an adhesion molecule are		

	associated with continued opioid use. PLoS One. 2020		
	Jun;15(6):e0234549.		
	<ul> <li>Inflammatory chemokine eotaxin-1 is correlated with age in heroin dependent patients under methadone maintenance therapy. Drug Alcohol Depend. 2018 Feb; 183:19-24.</li> </ul>		
	The business opportunities for substance use disorder diagnostic		
	indicators include the co-development of protein-based diagnostic		
	methods, integration of these indicators into existing market		
	technologies, incorporation of these indicators into novel diagnost technologies, and the co-recruitment of substance use disorder		
	patients from ethnic groups beyond Taiwanese for the verification of these indicators using new or traditional ELISA. Additional		
	opportunities include licensing the indicators, technology transfer of		
	the indicator methods, co-licensing of newly developed methods,		
	and providing support for indicator analysis methods in In Vitro		
	Diagnostic (IVD) applications.		
	The business opportunities in this case include assay co-		
	development, integration of the indicators into existing or novel		
Business	technologies, licensing the indicators for market or novel		
Opportunity	technologies, technology transfer of the indicators, and/or		
	collaboration for indicator/indicators in In Vitro Diagnostic (IVD)		
	applications.		
	The bio-indicator applications present business opportunities in the		
	following areas:		
	1. Licensing the indicators and integrating them into novel		
	technologies for technology transfer. This includes licensing and		
	technology transfer for physical status in assessing opioid,		
	Retamine, ampnetamine, and alcohol use disorders.		
	2. Co-development of IVD applications for clinical diagnostic		
	purposes.		
	nations, and global distribution for objective substance use		
	ulaghusis assistance.		