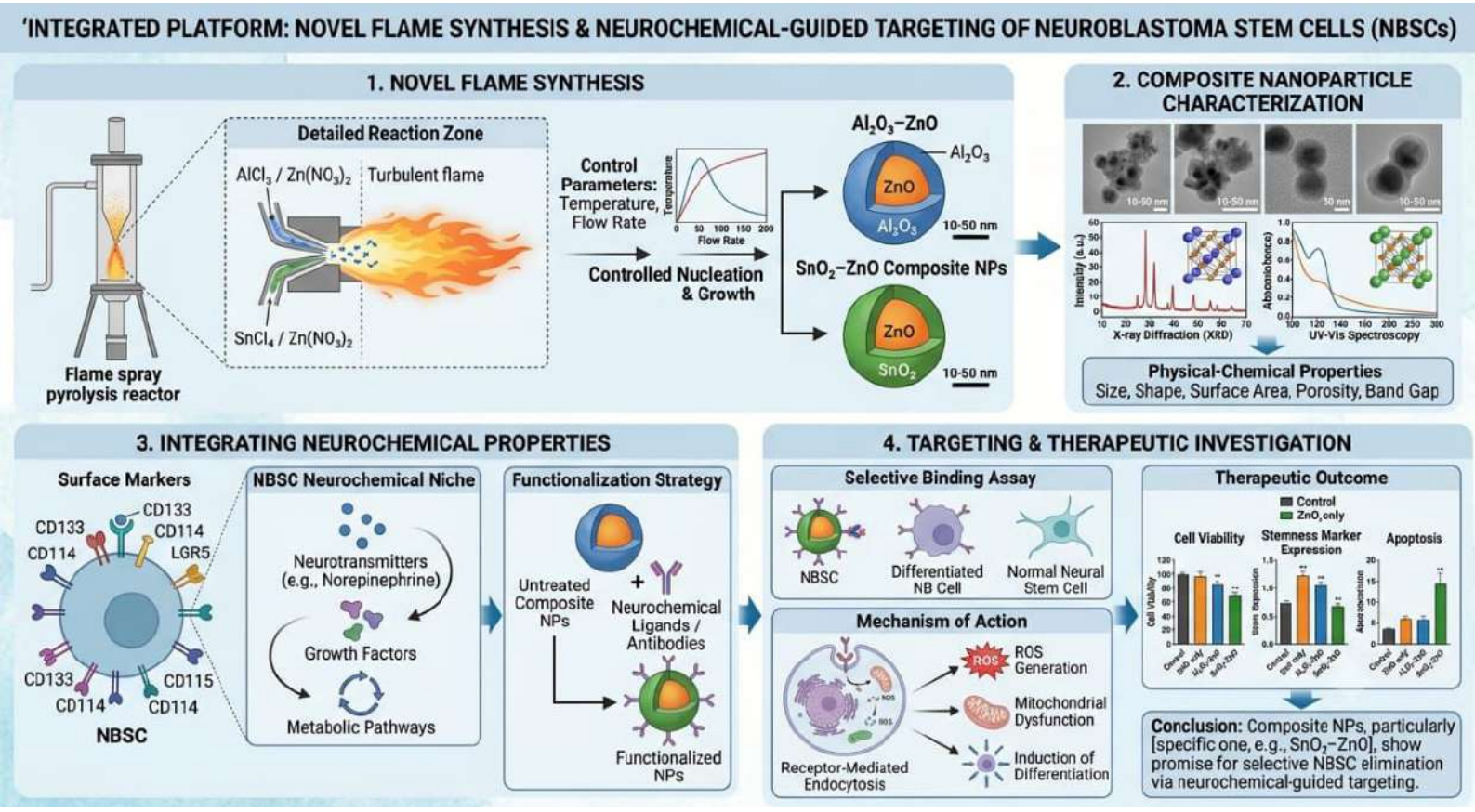

'INTEGRATED PLATFORM: NOVEL FLAME SYNTHESIS & NEUROCHEMICAL-GUIDED TARGETING OF NEUROBLASTOMA STEM CELLS (NBSCs)
1. NOVEL FLAME SYNTHESIS
Flame spray pyrolysis reactor
Detailed Reaction Zone
AlCl3 / Zn(NO3)2
Turbulent flame
SnCl4 / Zn(NO3)2
Control Parameters: Temperature, Flow Rate
Temperature
Flow Rate
Controlled Nucleation & Growth
Al2O3–ZnO
Al2O3
ZnO
Al2O3
10-50 nm
SnO2–ZnO Composite NPs
ZnO
SnO2
10-50 nm
2. COMPOSITE NANOPARTICLE CHARACTERIZATION
10-50 nm
10-50 nm
30 nm
10-50 nm
Intensity (a.u.)
X-ray Diffraction (XRD)
Absorbance
UV-Vis Spectroscopy
Physical-Chemical Properties
Size, Shape, Surface Area, Porosity, Band Gap
3. INTEGRATING NEUROCHEMICAL PROPERTIES
Surface Markers
CD133
CD133
CD114
CD114
LGR5
CD133
CD114
CD115
CD114
NBSC
NBSC Neurochemical Niche
Neurotransmitters (e.g., Norepinephrine)
Growth Factors
Metabolic Pathways
Functionalization Strategy
Untreated Composite NPs
Neurochemical Ligands / Antibodies
Functionalized NPs
4. TARGETING & THERAPEUTIC INVESTIGATION
Selective Binding Assay
NBSC
Differentiated NB Cell
Normal Neural Stem Cell
Mechanism of Action
ROS
ROS Generation
Mitochondrial Dysfunction
Induction of Differentiation
Receptor-Mediated Endocytosis
Therapeutic Outcome
Control
ZnO only
Cell Viability
Stemness Marker Expression
Apoptosis
Conclusion: Composite NPs, particularly [specific one, e.g., SnO2–ZnO], show promise for selective NBSC elimination via neurochemical-guided targeting.