

Detecting Direct Thyroid Disrupting Chemicals (TDC) *In Vitro*

Need

Chemicals that disrupt thyroid function can cause pronounced effects on thyroid hormone homeostasis resulting in significant adverse effects in humans. To evaluate chemicals for thyroid effects *in vitro*, a human primary thyrocyte model is required.

Solution

LifeNet Health has developed a fully functional 3D thyroid microtissue model in collaboration with the US Environmental Protection Agency (EPA). This is the first human primary thyrocyte model that maintains T4 synthesis and thyroglobulin (TG) production for several days, enabling longer-term studies. Endpoints for this model include:

Sodium/Iodide Symporter (NIS)

Pendrin

Triiodothyronine (T3)

Thyroxine (T4)

Thyroperoxidase (TPO)

Thyroid Stimulating Hormone Receptor (TSHR)

Thyroglobulin (TG)



Accurate & reliable data



Fast turnaround times



Unsurpassed expertise



Collaborative approach

Testing Parameters

ASSAY PARAMETERS	PROTOCOL
Cell Model	Human primary thyrocytes (3D microtissue)
Plate Format	96-well
Vehicle controls	DMSO plus media
No. Positive controls	1-3 (based on endpoints selected)
No. of Concentrations	6
Replicates	3
TA exposure time	24 hours
End Points (ELISAs)	TSHR, TG, TPO, Pendrin, T3, T4
End Points (Gene expression)	TSHR, NIS, TG, TPO, Pendrin
Time to complete	4-6 weeks
Regulatory	Non-GLP or GLP compliant
Deliverables	Detailed report including: graphs, tables, and statistical analyses where appropriate.

Example Plate Layout | Concentrations of TA

	1	2	3	4	5	6	7	8	9	10	11	12
A	VEHICLE						POSITIVE CONTROL					
B	TA1						TA3					
C	TA1						TA3					
D	TA1						TA3					
E	TA2						TA4					
F	TA2						TA4					
G	TA2						TA4					
H												

Note: Specific positive controls for each endpoint will be selected as required.