Table S1. Summary and comparison of findings for CNTs.

CNT		
Common Uses	**Positive Findings**	**Negative Findings**
cancer therapy	Structure of CNT appealing for drug delivery [1].	Microarray shows differentially expressed genes related to cancer when treated with MWCNT [2].
bone cell proliferation	anti-bacterial treatment by altered protein and ribosome expression, down regulated genes associated with glucose metabolism, DNA damage and oxidative stress [3].	Lung cancer biomarker upregulated when treated with MWCNT [4]. Lung disease related to SWCNT [5].
novel battery technologies	alternative microbial agent for food borne pathogens by differential gene expression related to membrane proteins and increased ROS production [6].	biomarker for human lung diseases: LC7A1 and SLC22A5 were downregulated in all mice and human tissue, blood and cell analyses. Affects: human primary hypertension, cardiovascular diseases, encephalopathy, cardiomyopathy, cardiomegaly, metabolic derangement, hypoglycemia, and muscle weakness [1, 7]
photovoltaics		Increased expression of ddit3 genes result in inflammatory response and increased ER stress when treated with MWCNT [8].
nano based transitioners		Increase in spindle disruption, abnormal mitotic spindles, and aneuploid chromosome number with the increased doses of MWCNTs [9].

Table S2. Summary and comparison of findings for QDs.

QD		
Common Uses	**Positive Findings**	**Negative Findings**
therapeutic targeting	QD-treated bacteria became more sensitive to polymyxin B which make them great candidates for adjuvant therapies for bacterial infections [10].	QDs negatively impact functions including transport, biosynthesis, and metabolism in *E. coli* [10].
treatment of cancer	Can efficiently deliver drugs to specific molecular targets, including cancer cells, at subcellular levels [11].	Pharmacokinetic of QD toxicity is not fully understood and could have potentially negative impacts to our health [11].

biological imaging	CdSe/ZnS QDs could be an effective alternative anticancer drug. With RNA-seq, they found HeLa cells up-regulated anti-tumorigenic functions [12].	Hazards encountered with QDs are much more complex than limitations created by common probes [11].
drug delivery system	InP/ZnS QDs could be a potential anticancer drug. With RNA-seq, they observed pro-apoptotic processes and control over motility in HeLa cells [13].	Hazards encountered with QDs are much more complex than limitations created by traditional delivery systems [11].
	QDs linked to some ligands have shown to emit brighter and be more photostable than organic dyes [11].	
	QDs have the potential to treat/diagnosis cancer with site-directed delivery because of their tunable fluorescence and modifiable surfaces for targeting [11].	

Table S3. Summary and comparison of findings for AgNPs.

AgNP		
Common Uses	**Positive Findings**	**Negative Findings**
Antibacterial treatment [14, 15]	Green synthesis for eco-friendly production [14, 16-19].	Essential genes linked to AgNP induced toxicity in yeast (met9, sfh1, and peg1) [20].
Water disinfection [21]	Anti-bacterial treatment by down-regulating TCA cycle genes (aceF, gadB) [22].	Upregulation of target genes MT and GST for understanding AgNP toxicity in yeast as it relates to chemogenetic screening [23].
Biofouling control [24]	Downregulation of biofilm formation genes in S. epidermidis (icaA and icaR) and S. aureus (fnbA and fnbB) [25].	Decreased viability in S. cerevisiae as a result of disrupted ribosome function and cell wall organization [26].
Agriculture and livestock treatments (Lee et al, Siddiqi et al, Kalinska et al)	Regulation of Hfq function in S. aureus as antibacterial mechanism [27].	Repression of cell survival genes in mouse fibroblast resulting in increased apoptosis [28].
Medical diagnostics (Lee et al)	Aflatoxin biosynthesis genes AFB1 and omt-A inhibited in A. flavus after AgNP treatment [29].	Increased expression of genes relevant to Alzheimers (GSS, CYCL12, MARCO) after AgNP exposure in mice neural cells [30].
	Inhibition of pathogenic melanin production in fungi by downregulation of PKS1 and SCD1 [31].	Altered genetic expression leading to increased susceptibility to carcinogens [32].

Increased expression of proapoptotic genes (p53, p21, Cyt C, Bid, Bax, Bak) in cervical cancer cells as potential anti-cancer treatment [33].

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