

**Table 3: In vitro effect of pollutants on human chondrocyte.**

Author and year of publication	Type of chondrocyte	Type of pollutant Duration of incubation	evaluation	Main Results
Pascarelli 2013 <sup>33</sup>	Cultured OA chondrocyte From femoral heads of 6 OA patients (arthroplasty)	Gold and silver nanoparticles Incubation for 24 hours	Cell viability, inducible NO synthase expression	<p>Cell viability : Significant dose-dependent toxic effect</p> <p>Gold : r = - 0.89</p> <p>Silver : r = - 0.96</p> <p>P&lt;0.001</p> <p>Survival cells for concentration of 250 µM : silver 10%, gold 30%, control 80%</p> <p>Increased presence of inducible NO synthase expression</p> <p>Increased expression of MMP1, MMP3, MMP13, ADAMTS 4 and 5</p>
Abella 2015 <sup>34</sup>	Cultured immortalized human juvenile costal chondrocyte	Non-dioxin PCB Incubation for 24 and 48 hours	Cell viability (MTT), LDH, p38MAPK, Bax, Bcl2, caspase 3, MDA, oxidative stress index	<p>Strong reduction of cell viability in a concentration dependent manner</p> <p>Survival cells for concentration of 10µM : 50-75% according to PCB subtypes after 24h incubation; 37-63% after 48h</p> <p>Necrosis : LDH augmentation</p>

					Apoptosis : p38MAPK phosphorylation, decreased expression of Bax and Bcl2, caspase 3 activation
					Oxidative stress : Increased oxidative stress index and MDA levels
Wang 2010 <sup>24</sup>	-Cultured OA chondrocyte from knee OA (arthroplasty),  - cultured chondrosarcoma cell	BPA	Cell viability, inducible synthase expression	NO	- on OA chondrocyte : little effect on NO production and no effect on cell viability  - on human chondrocyte : reversed the effect of estrogen on suppressing IL1 $\beta$ dependent MMP1 and NF-KB expression  - on chondrosarcoma cells : reduces NO production and cell viability  Survival cells for concentration of 100 $\mu$ M : 30%
Peng 1992 <sup>35</sup>	Cultured human embryonic chondrocyte	Fluvic acid  Incubation for 7 days	Morphology of cell, peroxidation, free radicals	lipid	Deformation of cell (fragmental, protuberances...) Increased lipid peroxidation

OA: osteoarthritis, PCB: polychlorinated biphenyls, MTT: methyl-thiazolyl-tetrazolium, LDH: lactate dehydrogenase, MDA: malondialdehyde, NO: nitric oxide, BPA: bisphenol A, IL1 $\beta$ : interleukine 1 beta, MMP: matrix mettaloproteinase, Bax: Bcl2 associated x protein, Bcl2: B cell lymphoma 2, MAPK: Mitogen-activated protein kinases.