Table 1. Raman spectroscopy methods and sample characteristics in the analysis of changes in the molecular composition of cartilage in the included studies.

Origin of Tissue	Specie (s)	Age, Sex and Sample Size (n)	Sample preparation and preservation	Studied peaks (cm^{-1})	Raman	Type of laser, wavelength (λ) and power (P)	Laser incidence	Reference (First autor, year)
Articular cartilage Eye	Mice	12-14 m/o, N.D., N.D.	Storage in ethanol at 4ºC	1230-40 1260-70	Raman Spectroscopy Microprobe	Near IR λ= 785 nm P = 105 mW	Superficial	Dehring, 2006
Knee cartilage Reference tissues: cartilage, subchondral bone, cancellous bone arm	Human	N.D. N.D. N.D.	Preservation and measurements in Phosphate Buffered Saline (PBS)	1070, 1063, 958, 920 Reference: 1002	Fiber-Optic Raman Spectroscopy	Near IR λ= 785 nm P= 10 mW	Superficial	Esmonde-White, 2011
Healthy knee cartilage	Pig	2-5 m/o, N.D. N.D.	Incubation in DMEM 10% for 7 days, under 0 (n=10), 15, 20 y 25 MPa (n=5)	1264-74, 1126, 1063, 856, 875, 940, 957	Polarized Raman Spectroscopy	Near IR λ= 785 nm P =100 mW	Superficial	Lim, 2011
Fetal femur cartilage Articular cartilage	Human Bovine	20 w/o, N.D., N.D. 10 m/o, N.D., N.D.	Cryopreservation Inclusion in cryomatrix	937, 954, 1001, 1062, 1448, 1656, 1576	Confocal Raman Microspectroscopy	Kr-ion λ= 647 nm P= N.D.	Superficial Transversal	Kunstar, 2012
Femoral hip cartilage Tendons	Human Turkey	76 y/o, Female, n=1 24 w/o, N.D., N.D.	Dehydratation in ethanol; Inclusion in polymethyl methacrylate (PMMA)	1060, 1375, 1245-70, 400	Raman Microspectroscopy	Near IR λ= 785 nm P = 100 mW	Superficial Transversal	Gamsjaeger, 2014
Knee cartilage from replacement surgery	Human	82-84 y/o Female, n=1	Cryopreservation in saline solution	1241/1269 ratio	Raman Microspectroscopy	Kr-ion λ= 647 nm P= 35 mW	Superficial	Takahashi, 2014
Healthy vs OA cartilage Cartilage with vs without lesion	Human Rat	N.D., N.D. n=1 vs n=1 N.D., N.D., n=59 vs n=48	Paraffin inclusion	1665, 1451, 1245, 1004, 940, 816, 922, 857	Raman Microspectroscopy	Argon λ= 514 nm P= 25 mW	Middle Zone Transversal	Richardson, 2014
Cartilage ICRS grades I, II y III	Human	N.D., N.D., n=27	Formalin fixation	1245-70, 1064 Reference: 1004	Confocal Raman Microspectroscopy	He-Ne λ= 632 nm P= 8 mW	Superficial	Kumar, 2015

Metacarpal-phalangeal joint cartilage and TE constructs	Bovine	24-36 m/o, N.D., n=5 and N.D.	Criopreservation in PBS Paraffin fixation	3400, 1410, 1345, 1245, 960, 795	Confocal Raman Microspectroscopy Mapping	Green laser λ= 532 nm P= 75 mW	Superficial Transversal	Berghlot, 2016
Metacarpal-phalangeal joint cartilage	Bovine	24-36 m/o, N.D., n=19	Preservation in PBS at 4ºC until analysis (36h)	2830-3005	Confocal Raman Microspectroscopy Mapping	Green laser λ= 532 nm P= 34 mW	Transversal	Mansfield, 2017

Obs.: m/o: months-old; w/o: weeks-old; y/o: years-old; N.D.: not described; TE: tissue engineered; IR: Infra-red; ICRS: International Cartilage Regeneration and Joint Preservation Society; DMEM: *Dulbecco Modified Eagle Medium*