

No	Year	Authors	Species	Defect model	Carrier	Growth factors	Cell therapy	Evaluation method
1	1999	Toriumi et al. [46]	Dogs	Body	PLGA	BMP-2		Histology, radiography, immunohistochemistry
2	2001	Schliephake et al. [64]	Sheep	Body	Collagen			Histology, immunohistochemistry, SEM
3	2001	Terheyden et al. [109]	Mini-pigs	Angle	Xenogenic graft	rHOP-1		Fluorescence microscopy, SPECT
4	2001	Seto et al. [70]	nHPs	Body	PLGA	BMP-2	BMSCs	Histology, radiography
5	2002	Marukawa et al. [66]	nHPs	Body	PLGA	BMP-2		Histology, radiography
6	2003	Arosarena et al. [54]	Rats	Body	Collagen, HAP			Histology, fluorescence microscopy
7	2003	Park et al. [61]	Rats	Body		BMP-2	BMSCs	Histology, radiography, immunohistochemistry
8	2004	Abu-Serriah et al. [72]	Sheep	Body	Collagen	BMP-7		Histology, immunohistochemistry, fluorescence microscopy
9	2004	Kontaxis et al. [74]	Sheep	Body	Collagen	BMP-7		Biomechanical testing
10	2004	Yamada et al. [67]	Dogs	Body	Autologous		MSCs	Histology, radiography, immunohistochemistry
11	2004	Wang et al. [63]	Mini-pigs	Body	Collagen	rHOP-1		Histology, radiography, biomechanical testing
12	2005	Arosarena et al. [52]	Rats	Body	Hyaluronic acid-based, collagen/HAP/ β TCP	BMP-2		Histology, immunohistochemistry
13	2005	Arosarena et al. [53]	Rats	Body	Hyaluronic acid-based	BMP-2 + BMP-4		Histology, fluorescence microscopy
14	2005	Abu-Serriah et al. [73]	Sheep	Body	Collagen	rHOP-1		Histology, immunohistochemistry, biomechanical testing
15	2005	Srouji et al. [91]	Rats	Ramus		TGF1+IGF-1		Histology, radiography
16	2006	Jiang et al. [29]	Rabbits	Body		BMP-4	BMSCs	Histology
17	2006	Eckholm et al. [89]	Sheep	Body	β TCP-based, PCL			Histology, radiography
18	2006	Boyne et al. [55]	nHPs	Body	Collagen	BMP-2		Histology
19	2006	Seto et al. [68]	nHPs	Body	Collagen	BMP-2	BMSCs	Histology, radiography
20	2006	Wu et al. [31]	Dogs	Body	β TCP-based		BMSCs	Histology
21	2006	Mankani et al. [42]	Mice	Body	HAP/ β TCP		BMSCs	Histology, biomechanical testing
22	2007	He et al. [37]	Dogs	Body	β TCP-based		BMSCs	Histology, radiography, SEM, biomechanical testing
23	2007	Yuan et al. [38]	Dogs	Body	β TCP-based		BMSCs	Histology, radiography, SEM, biomechanical testing
24	2007	Issa et al. [87]	Rats	Body	Chitosan-based	BMP-2		Histology
25	2008	Springer et al. [58]	Rats	Body		BMP-2 + FGF		Histology
26	2008	Schliephake et al. [60]	Rats	Ramus	PLA	BMP-2		Histology, radiography, immunohistochemistry
27	2009	Zhang et al. [108]	Rabbits	Ramus	PLGA	BMP-2		SEM
28	2010	Zhao et al. [30]	Rats	Ramus	β TCP-based	BMP-2	BMSCs	Micro-CT, histology, immunohistochemistry
29	2010	Gallejo et al. [83]	Rats	Body	Xenogenic graft		Osteoblasts /osteocytes	Micro-CT, histology, immunohistochemistry, SEM
30	2010	Li et al. [28]	Rabbits	Body	HAP	BMP-7	MSCs	Histology, radiography, biomechanical testing
31	2010	Jégoux et al. [90]	Dogs	Body	Collagen, HAP/ β TCP			Micro-CT, histology, SEM

32	2012	Guo et al. [23]	Rabbits	Body + Angle	HAP	BMP-2	BMSCs	Histology, radiography, RT- PCR
33	2012	Busuttill Naudi et al. [75]	Rabbits	Body	β -TCP-based	BMP-7	MSCs	Histology, radiography
34	2012	Herford et al. [45]	nHPs	Body	Collagen, HAP/ β TCP	BMP-2		Micro-CT, histology
35	2012	Hussein et al. [88]	Dogs	Body	Collagen	BMP-2 + VEGF		Micro-CT, immunohistochemistry, RT-PCR
36	2013	DeConde et al. [51]	Rats	Body	PLGA	BMP-2		Micro-CT, histology
37	2013	Streckbein et al. [62]	Rats	Body			ADSCs	Micro-CT, histology, radiography
38	2013	Su et al. [25]	Rabbits	Body		BMP-2 + FGF	BMSCs	Histology, radiography
39	2013	Liu et al. [32]	Rabbits	Body	PLA			Histology, radiography
40	2013	Kim et al. [79]	Rabbits	Body	Collagen	BMP-2	MSCs	Micro-CT, histology, radiography
41	2013	Khojasteh et al. [82]	Dogs	Body	PCL/ β TCP		MSCs	Histology, SEM
42	2014	Liu et al. [24]	Rats	Ramus	Collagen	SDF-1 α		Micro-CT, biomechanical testing
43	2014	Fan et al. [49]	Rats	Body	Chitosan-based	BMP-2	ADSCs	Micro-CT, histology, immunohistochemistry
44	2014	Liu et al. [27]	Rabbits	Body	PCL/HAP	BMP-2		Micro-CT, histology
45	2014	Alfotawei et al. [71]	Rabbits	Body	β TCP-based	BMP-7	BMSCs	Histology, radiography, CBCT
46	2014	Yun et al. [78]	Dogs	Body	HAP/ β TCP	BMP-2		Micro-CT, histology
47	2014	Behnia et al. [81]	Dogs	Body	Collagen		SHED	Histology
48	2015	Jin et al. [77]	Rats	Body	Hyaluronic acid-based	BMP-2	BMSCs	Micro-CT, histology
49	2015	Gallego et al. [84]	Sheep	Body	Autologous		BMSCs	Micro-CT, histology
50	2015	Lee et al. [40]	Rats	Body	PLGA	BMP-2	ADSCs	Micro-CT
51	2015	Lohse et al. [56]	Rats	Ramus	PDLLA/CaCO3	BMP-2		Histology, radiography
52	2015	Konopnicki et al. [48]	Mini-pigs	Body	β TCP-based, PCL		BMSCs	Histology, radiography, immunohistochemistry
53	2016	Das et al. [50]	Rats	Body	PLGA	BMP-6 + VEGF	MSCs	Micro-CT, histology, immunohistochemistry
54	2016	Zhang et al. [22]	Rabbits	Body	Collagen	BMP-2		Histology, radiography
55	2016	Song et al. [100]	Rabbits	Body	Chitosan/collagen	BMP-2	MSCs	Micro-CT, histology
56	2016	Tee et al. [43]	Swine	Body	β TCP-based, PLGA	BMP-2 + VEGF	BMSCs	Micro-CT, histology, radiography
57	2017	Moser et al. [57]	Rats	Body	PDLLA/CaCO3	BMP-2		Histology, immunohistochemistry, RT-PCR
58	2017	Poudel et al. [80]	Rats	Body	Collagen	FGF	BMSCs	Micro-CT, histology, RT-PCR
59	2017	Wang et al. [33]	Rabbits	Body	PLGA	Insulin	BMSCs	Micro-CT, histology
60	2017	Çakır-Özkan et al. [92]	Mini-pigs	Body	PLLA/PEG	BMP-2 + VEGF		Histology, radiography, immunohistochemistry, RT-PCR, biomechanical testing
61	2017	Fan et al. [41]	Rats	Body	PLGA	BMP-2+phenamil	MSCs	Micro-CT, histology, immunohistochemistry
62	2017	Maglione et al. [99]	Rats	Body	Chitosan		ADSCs	Micro-CT, histology
76	2017	Ozaki et al. [65]	Rats	Angle	Collagen	rHOP-1	Osteoblasts /osteocytes	Micro-CT, histology, radiography
63	2018	Lopez et al. [44]	Rabbits	Body	β TCP-based			Micro-CT, histology
64	2018	Wang et al. [95]	Rats	Body		BMP-2	BMSCs	Micro-CT, histology
65	2018	Nuntanaranont et al. [98]	Rabbits	Body	PCL/ β TCP		BMSCs	Histology, radiography

66	2018	Cui et al. [34]	Mini-pigs	Body	Autologous		BMSCs	Histology, radiography
67	2018	Khojasteh et al. [97]	Dogs	Body	Collagen	BMP-2		Histology, radiography, immunohistochemistry
68	2019	Tateno et al. [39]	Rats	Body	Collagen		DFAT	Micro-CT, histology, radiography
69	2019	Lopez et al. [69]	Rabbits	Ramus	β TCP-based	Dipyridamole		Micro-CT, histology
70	2019	Deng et al. [76]	Rabbits	Body	Chitosan-based	BMP-2		Micro-CT, histology, immunohistochemistry
71	2019	Stigler et al. [94]	Sheep	Body	β TCP-based, PTFE		MSCs	Histology, radiography
72	2019	Carlisle et al. [93]	Mini-pigs	Body	β TCP-based, PU	BMP-2		Micro-CT, radiography, immunohistochemistry
73	2019	Li et al. [86]	Dogs	Angle	HAP/ β TCP-based	BMP-2		Micro-CT, histology, immunohistochemistry, SEM
74	2019	Helal et al. [96]	Dogs	Body	PLA/HAP/ β TCP			Histology, immunohistochemistry, CBCT
75	2019	Yahia et al. [59]	Rabbits	Ramus	PCL, Chitosan-based			Histology, SEM, CBCT
77	2020	Park et al. [85]	Rabbits	Body	PCL/ β TCP		MSCs	Micro-CT, histology
78	2020	Witek et al. [47]	Sheep	Body	PLGA	L-PRF		Immunohistochemistry
79	2020	Probst et al. [35]	Mini-pigs	Body + Angle	β TCP-based, PLGA		ADSCs	Micro-CT, histology, radiography, immunohistochemistry
80	2020	Gutiérrez-Quintero et al. [26]	Rabbits	Body	HAP/PLGA		DPSCs	Histology, radiography
81	2021	Xu et al. [105]	Rabbits	Body	β TCP-based	BMP-2 + FGF	BMSCs	Histology, radiography
82	2021	Lee et al. [106]	Dogs	Body	PCL/ β TCP		ADSCs	Histology, radiography, immunohistochemistry, RT-PCR
83	2021	Park et al. [107]	Dogs	Body	PCL/ β TCP	BMP-2		Micro-CT, histology, SEM
84	2021	Cao et al. [103]	nHPs	Body	PLGA/ β TCP	BMP-2		Histology, radiography, biomechanical testing
85	2021	Barrientos-Lezcano et al. [104]	Rats	Angle	HAP		ADSCs	Histology
86	2022	Mao et al. [101]	Rabbits	Body	HAP/Collagen	CGF	MSCs	Micro-CT, histology, immunohistochemistry
87	2022	Zhu et al. [102]	Rabbits	Body	HAP/Collagen	CGF		Micro-CT, histology, radiography, immunohistochemistry, biomechanical testing
88	2022	Stevanovic et al. [36]	Swine	Body	HAP/PLGA, HAP/PEI, Xenogenic graft			Histology, immunohistochemistry, CBCT