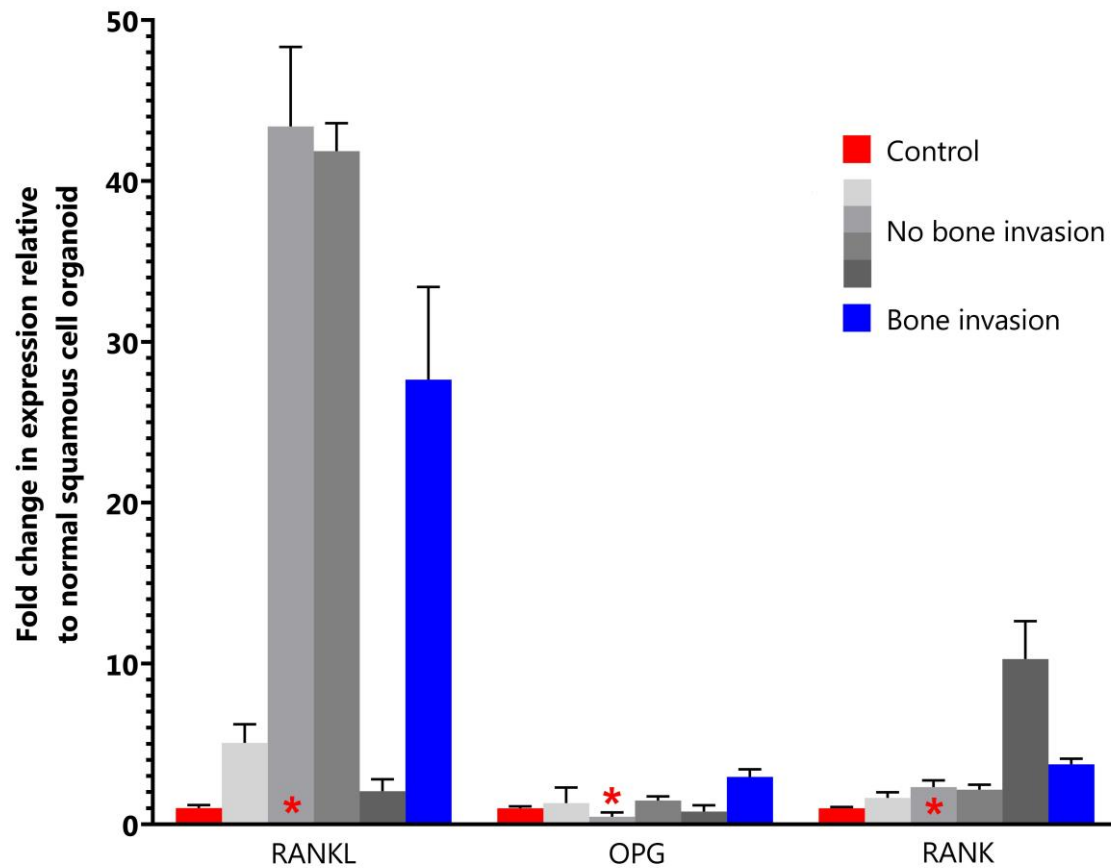
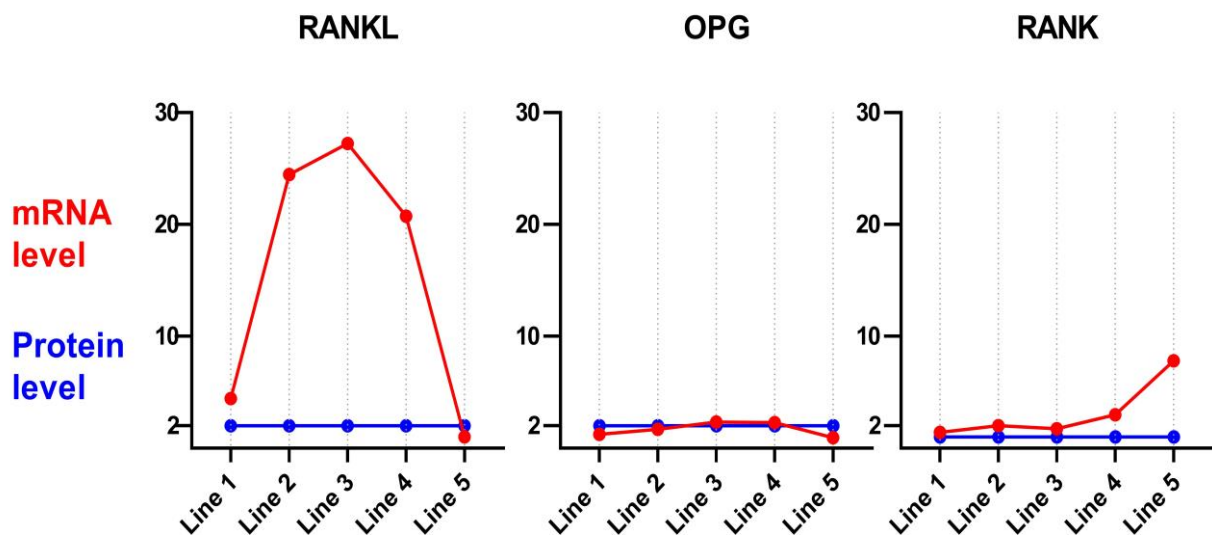




Supplemental figure 1: Results of 2nd quantitative PCR. *indicates HPV positive organoid line



Supplemental figure 2: Comparison mRNA-expression and protein-expression for RANKL, OPG and RANK

Supplemental Table 1: Primers for qPCR

primer name		primer sequence	length of product
Human RANKL(TNFSF11)	Forward 1	CAACATATCGTTGGATCACAGCA	161
Human RANKL(TNFSF11)	Reverse 1	GACAGACTCACTTTATGGGAACC	
Human RANKL(TNFSF11)	Forward 2	CCCATAAAGTGAGTCTGTCC	256
Human RANKL(TNFSF11)	Reverse 2	CAATACTTGGTGCTTCCTCC	
Human OPG(TNFRSF11B)	Forward 1	CACAAATTGCAGTGTCTTTGGTC	216
Human OPG(TNFRSF11B)	Reverse 1	TCTGCGTTTACTTTGGTGCCA	
Human OPG(TNFRSF11B)	Forward 2	GAAGGGCGCTACCTTGAGAT	102
Human OPG(TNFRSF11B)	Reverse 2	GCAAACGTATTTTCGCTCTGG	
Human RANK(TNFRSF11A)	Forward 1	TCCTCCACGGACAAATGCAG	92
Human RANK(TNFRSF11A)	Reverse 1	CAAACCGCATCGGATTTCTCT	
Human RANK(TNFRSF11A)	Forward 2	CACCAAATGAACCCCATGTTTAC	182
Human RANK(TNFRSF11A)	Reverse 2	GGACTCCTTATCTCCACTTAGGC	

Supplemental Table 2: Statistical testing of differences between tumor expression and normal mucosa expression and differences of expression within tumor. All tests were mann-whitney *U* tests. NS: Not Significant.

	Differences in expression Tumor vs Normal			Differences in expression Within tumor		
	<i>Back vs Normal</i>	<i>Center vs Normal</i>	<i>Front vs normal</i>	<i>Front vs Back</i>	<i>Front vs Center</i>	<i>Center vs Back</i>
RANKL						
No invasion	p<0.01	p<0.01	p<0.01	NS	NS	NS
Erosion	p<0.01	p<0.01	p<0.01	NS	NS	NS
Invasion	p<0.01	p<0.01	p<0.01	p<0.05	NS	NS
OPG						
No invasion	NS	NS	p<0.05	NS	NS	NS
Erosion	p<0.05	p<0.05	NS	NS	NS	NS
Invasions	p<0.05	p<0.01	p<0.05	NS	NS	NS
RANK						
No invasion	NS	NS	NS	p<0.05	NS	p<0.05
Erosion	NS	p<0.01	p<0.01	p<0.01	NS	p<0.05
Invasion	NS	NS	NS	p<0.01	NS	p<0.01