



# HIGH ENTROPY ALLOY WITH SUPERIOR CHARACTERISTICS FOR DENTAL APPLICATIONS

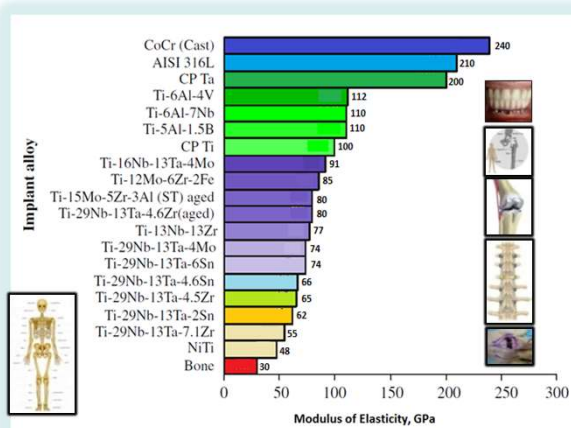
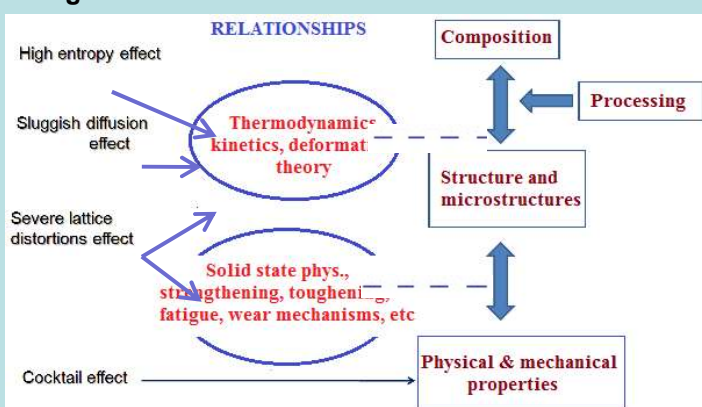
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## High Entropy Alloys (HEAs) Motivation and Implant Biomaterials

High entropy alloys was started in Tsing Hua University of Taiwan since 1995 by Yeh and al. and were defined as alloys having 5 to 11 major elements in the composition, mole fraction of each element being between 5% to 30%.



Alloys used for dental restoration, endodontic implantations and orthodontics: 304 and 316 stainless steel; Co alloys; Ni-Ti martensitic and austenitic; CP-Ti; Ti-6Al-4V ELI ; Ti-Nb; Ti-Zr; Ti-Ta; Ti-Ta-Nb/Zr/Sn; Ni-Ta.

## BIOHEAs Production, Concept and Results

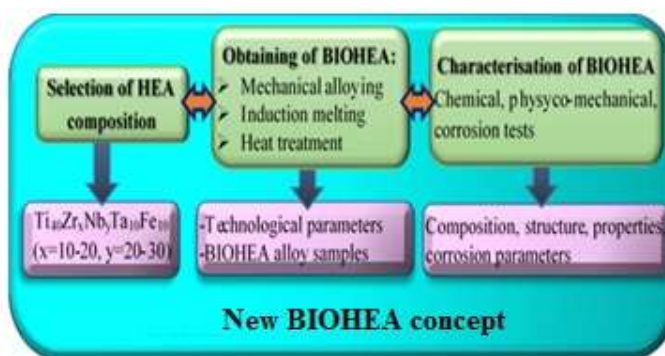
### Arc Melting



Linn MFG-30 induction furnace:  
 1 – voltage generator; 2 – melting induction furnace.



Retsch PM 400 ball mill



$B_0$  and  $M_d$  values for alloying elements with beta Ti

Element	$B_0$	$M_d$
Ti	2790	2.447
Zr	3086	2.934
Nb	3099	2.424
Ta	3144	2.531
Fe	2651	0.969

