



Complex-Dynamic Biology

Reliable Genetics and Integral Medicine

- ▶ *Dynamically probabilistic fractal* as unified *living structure*: *unreduced solution* to many-body *interaction* problem
- ▶ *Unreduced life properties*: autonomous probabilistic adaptability and development, purposeful “*élan vital*”, huge power of living processes (“*life force*”)
- ▶ *Symmetry of complexity* or *complexity correspondence principle*: the underlying *symmetry/reason of evolution* and individual system *development*
- ▶ *Universal prescription*: take into account the *full, unreduced interaction power* → reliable genetics, integral medicine

Reliable Genetics: Unreduced Genome Interactions

Number of genome interaction links

$$N_{\text{genome}} \geq N_{\text{brain}} \geq 10^{10} \times 10^4 = 10^{14}$$

Number of interaction links per gene ($N_{\text{gene}} \approx 3 \times 10^4$)

$$n_{\text{eff}} \geq N_{\text{genome}} / N_{\text{gene}} \approx 3 \times 10^9 \gg N_{\text{gene}} \geq N_{\text{base}}$$

$N_{\text{base}} \approx 3 \times 10^9$ is the number of genome "bases"



(1) Genome is mainly *interaction place*, not a ready "programme"

(2) Every genome element interacts with any other one
(*everything interacts with everything*)



Huge interaction power → the property of life

$$P \propto N_{\text{all}} \sim 10^{10^{15}} \gg 10^{N_{\text{genome}}}$$

Reliable Genetics: G-bomb and Evolution Mechanism

- Genome interaction neglect leads to **catastrophe**
huge power of real complexity is destroyed down to zero
- Destruction results **accumulate** and **appear later**
delayed-action genetic bomb (G-bomb)
- Step-like complexity **evolution mechanism**
necessary combination of robustness and flexibility



Unreduced interaction complexity and its evolution
involves the entire genome and epigenetic components



Serious change in genetic theory and practice



Integral medicine: organism as unreduced interaction complexity
causal, reliable understanding of life → biomed applications