



CALCULATIONS FOR MOLECULAR BIOLOGY

Laboratory work in Molecular Biology and Biochemistry involves the use of very small volumes and often very dilute solutions. Many hormones are biologically active at concentrations well below 10^{-6} M. For this reason the standard calculation strategies used in Chemistry and the use of SI units is inappropriate and leads to confusion. To further complicate the picture, experiments in Molecular Biology often involve a convoluted series of dilutions and the use of complex multi-component buffers made up from many stock solutions.

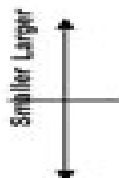
Rather than using the traditional formulae, studiously rote learned for the HSC, it is usually faster, easier and less error prone to change strategies. There are a few key principles to efficient laboratory calculations in Molecular Biology; if these are adhered to there is a lot less pain in the calculations.

Think small!!!

In Molecular Biology we rarely use molar concentrations and we never use litre volumes so let's work with the units we are using. To use a basic example, I don't measure the distance from my house to the station in millimeters, rather I use the more sensible unit, kilometers. Conversely you would not measure the diameter of a cell in kilometers; you would use microns (μm). By changing the prefix we can scale the units up or down very simply. It gives us units with numbers we have half a chance of calculating without the use of the calculator (or worse still the mobile phone). Try the use of prefixes for volume and concentration units:

Prefix	Factor	Volume unit	Concentration unit
G (giga)	10^9	GL (giga litre)	
M (mega)	10^6	ML (mega litre)	
K (kilo)	10^3	kL (kilo litre)	
	1	L (litre)	M (mol/L)
m (milli)	10^{-3}	ml (milli litre)	mM (milli mol/L)
μ (micro)	10^{-6}	μl (micro litre)	μM (micro mol/L)
n (nano)	10^{-9}	nl (nanolitre)	nM (nano mol/L)

With this logic a 0.01 M solution becomes a 10 mM solution and a 1×10^{-6} M solution becomes 1 μM . This starts to make the arithmetic easier.



Biochemical Calculations

Jicheng Xie



Biochemical Calculations:

Decoding **Biochemical Calculations**: Revealing the Captivating Potential of Verbal Expression

In an era characterized by interconnectedness and an insatiable thirst for knowledge, the captivating potential of verbal expression has emerged as a formidable force. Its capability to evoke sentiments, stimulate introspection, and incite profound transformations is genuinely awe-inspiring. Within the pages of "**Biochemical Calculations**," a mesmerizing literary creation penned by a celebrated wordsmith, readers embark on an enlightening odyssey, unraveling the intricate significance of language and its enduring impact on our lives. In this appraisal, we shall explore the book's central themes, evaluate its distinctive writing style, and gauge its pervasive influence on the hearts and minds of its readership.

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