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：①极性氨基酸：其中包括赖氨酸、精氨酸、组氨酸3种碱性氨基酸（带负电荷）；谷氨酸、天门冬氨酸2种酸性氨基酸（带正电荷）；丝氨酸、苏氨酸、天冬酰胺、谷氨酰胺、酪氨酸、半胱氨酸6种不带电荷。②非极性氨基酸：共有9种，分别为甘氨酸、丙氨酸、缬氨酸、亮氨酸、异亮氨酸、苯丙氨酸、蛋氨酸、色氨酸、脯氨酸

**Pcr工作原理polymerase chain reaction**

类似于DNA的天然复制过程，其特异性依赖于与靶序列两端互补的寡核苷酸引物。PCR由变性--退火--延伸三个基本反应步骤构成：①模板DNA的变性：模板DNA经加热至93℃左右一定时间后，使模板DNA双链或经PCR扩增形成的双链DNA解离，使之成为单链，以便它与引物结合，为下轮反应作准备；②模板DNA与引物的退火(复性)：模板DNA经加热变性成单链后，温度降至55℃左右，引物与模板DNA单链的互补序列配对结合；③引物的延伸：DNA模板--引物结合物在TaqDNA聚合酶的作用下，以dNTP为反应原料，靶序列为模板，按碱基配对与半保留复制原理，合成一条新的与模板DNA链互补的半保留复制链重复循环变性--退火--延伸三过程，就可获得更多的“半保留复制链”，而且这种新链又可成为下次循环的模板。每完成一个循环需2～4分钟，2～3小时就能将待扩目的基因扩增放大几百万倍。

Similar to the natural DNA replication process, its specific target sequence depends on both ends with complementary oligonucleotide primers. PCR by the degeneration - annealing - extension of three basic reaction steps components: ① the template DNA denaturation: template DNA was heated to about 93 ℃, after a certain time, so that double-stranded DNA templates by PCR amplification or the formation of double-stranded DNA solution away, making a single chain, so that it primer binding, for the next round of reactions to prepare; ② template DNA and primer annealing (recovery of): template DNA was heated denatured into a single chain, the temperature dropped to 55 ℃ or so, primers and template DNA single-strand binding complementary sequence pair; ③ extension primer: DNA template - primer conjugates under the action of the TaqDNA polymerase to dNTP as the reaction raw material, the target sequence as a template by base pairing with the semi-reservation copy principle, synthesis of a new chain with the template DNA chain of complementary repeat cycle of semiconservative replication degeneration - annealing - extension of three processes, you can get more "semi-reserved reproduction chain", and the new chain can be the next cycle of the template. Required to complete a cycle every 2 to 4 minutes, 2 to 3 hours can be extended to amplify target gene amplification by millions.

Structure of Nucleotides

in DNA•Each nucleotide consists of–Deoxyribose(5-carbon sugar) –Phosphate group–A nitrogen-containing base•Four bases–Adenine, Guanine, Thymine, Cytosine

