distribution observed in RBC[7]. This would not explain both curves of figure 2 since they are so similar. Although it has been claimed that the oldest circulating RBC have electrophoretic mobilities up to 30% lower than the young cells[8,9], this was not confirmed recently[10]. However the extensive heterogeneity of cell surface carbohydrate of the circulating population of RBC[11] could influence RBC adhesive behavior to polystyrene.

In conclusion, n-RBC are more adhesive than RBC to a saline-polystyrene interface. Adhesion of both type of cells increases with salt concentration. This is consistent with the hypothesis that attractive electrodynamic and repulsive electrostatic forces underlie the behavior of biological cells[1,4,5]. Experiments are underway to assess to implication of these results on hemagglutination assays performed in polystyrene microplates and on the properties of polystyrene microbeads used as cytochemical markers for electron microscopy.

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The asymmetry of the nucleotide bases and amino acids

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Summary. Due to the electric polarisation induced by the carbon and nitrogen atoms, the molecules of the nucleotide bases present a stereo-asymmetry. The DNA right-handed double helix is determined by the asymmetry of the nucleotide bases and it is concordant with the right-handed α-helix of the polypeptide molecules formed by L-amino acids.

The asymmetry of the nucleotide bases can be defined by 3 orthogonal axes, which form an asymmetric system: a) The (x→x′) axis goes from the external side of the nucleotide base molecule to its internal side, where the hydrogen bonds with the complementary nucleotide base are formed (figure 1, a). b) The (y→y′) axis goes from the ($-NH_2$), or ($-C=O$) groups (situated at the superior pole of the molecule) to the nitrogen atom, situated opposite in the ring of the purine or pyrimidine molecule (figure 1, a). c) The (z→z′) axis is perpendicular on the molecular plan, and passes through the intersection of the 2 other axes.

In the ring of the pyrimidine and purine molecules, there is an alternation of carbon and nitrogen atoms C(1)→N(2)→C(3)→N(4)→ (figure 1, a). The nitrogen atom is more electronegative than the carbon atom[1], with the result that in a covalent bond (C:N) the electronic cloud is deviated from the carbon to the nitrogen atom (C→N). The electric polarization is increased by the presence of the chemical group situated at the superior pole of the nucleotide base[2]. The electric polarization is propagated along the chain of atoms in the direction: $C^+(1)\rightarrow N^-(2)\rightarrow C^+(3)\rightarrow N^-(4)\rightarrow$ (figure 1, a). Due to the presence of the delocalized π-electrons, an electronic current arises in the molecular ring, in the presence of an outer magnetic field. Subsequently, a magnetic molecular moment is also produced[2]. Starting from these elements, we define: a) The superior face of the nucleotide base is the molecular surface at which an observer sees the rotation: $C^+(1)\rightarrow N^-(2)\rightarrow C^+(3)\rightarrow N^-(4)\rightarrow$, following a clockwise direction; b) the inferior face of a nucleotide base is the molecular surface at which an observer sees the above mentioned rotation following a counter clockwise direc-

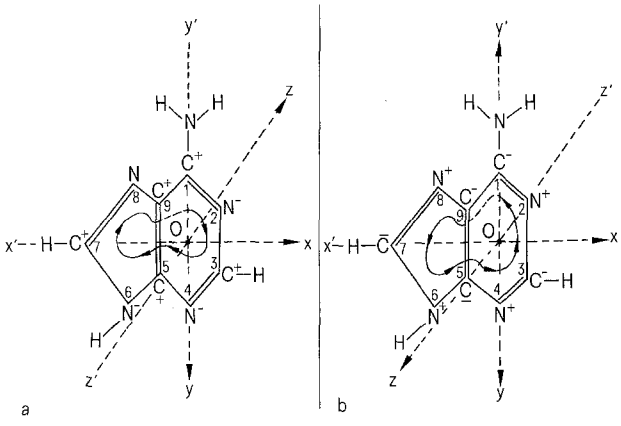

Fig. 1. Adenine (a) and antiadenine (b). (x→x′), (y→y′) and (z→z′), the axes of the molecular asymmetry.

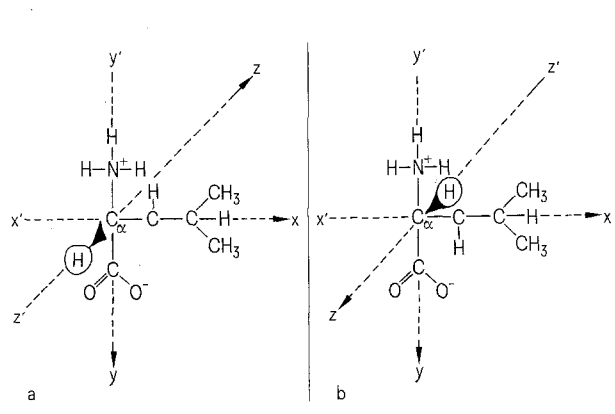

Fig. 2. The asymmetry of the amino acids: a) L-valine; b) D-valine.

tion; c) the (z→z′) axis is directed from the inferior to the superior face of the nucleotide base molecule. The differentiation of the 2 faces of a nucleotide base molecule has a functional significance, because in the DNA system, 2 complementary nucleotide bases interconnect so that locking at the common molecular plan, a nucleotide base is directed with the superior face, and another with the inferior face to the observer.

It is possible to imagine some nucleotide bases symmetrical in mirror with the natural nucleotide bases, by substituting in the natural nucleotide bases the carbon, nitrogen, oxygen and hydrogen atoms with their correspondent antiatoms. In the antinucleotide base molecules, the rotational direction of the positrons in the ring becomes: $C^-(1) \leftarrow N^+(2) \leftarrow C^-(3) \leftarrow N^+(4) \leftarrow$ and the (z→z′) axis changes its direction (figure 1, b). Because the antinucleotide bases are not present in nature, the asymmetry of the nucleotide bases is unique in nature.

The asymmetry of the amino acids molecules can be defined by 3 orthogonal axes: a) The (x→x′) axis goes from C_a-asymmetric carbon to the chemical group situated at the end of the root R (figure 2, a). b) The (y→y′) axis goes from ($-NH_3^+$) group to ($-COO^-$) group (figure 2, a). c) The (z→z′) axis is perpendicular in origin to the above-mentioned plan. The peak of the (z→z′) axis is directed in the reverse direction of the hydrogen atom, which is bound to the C_a-carbon atom (figure 2, a). By directing a L-amino acid and a D-amino acid molecules, so to have their (x→x′) axes and their (y→y′) axes parallel, then the 2 (z→z′) axes are antiparallel (figure 2, a and b).

Living organisms are strictly selective for L-amino acids[3-5]. A polypeptide chain, formed by L-amino acids, usually (due to the minimum energy) has the form of a right-handed α-helix[6]. The D-amino acids, usually make polypeptide chains having the shape of a left-handed α-helix. The available data indicate that the 2 strands of DNA form a right-handed double helix[7]. The concordance between the direction of rotation of a polypeptide chain, built by L-amino acids, and the polynucleotide strands of DNA, certainly play an important functional role. For example, it favours the coupling between the polypeptide signal molecules in DNA and their corresponding receiver genes. This indicates that the predilection of the living organisms for L-amino acids is due to the unique asymmetry of the nucleotide bases.

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Circadian change of sweating rate measured locally by the resistance hygrometry method in man

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Summary. There existed circadian change in the sweating rate locally measured from the anterior of the left thigh: the sweating rate showed a remarkable decline during the period 2.00–5.00 h, while at other times throughout the day it generally remained high. This reduction seemed to be independent of sleep or sleeplessness.

In thermoneutral ambient temperature zones, there exists a circadian change of total dry heat loss due to radiation, convection and conductance, and this circadian change is primarily responsible for the creation of the circadian core temperature rhythm in man[2,3]. However, it remains to be known to what extent the sweating rate could contribute to the circadian rhythm in core temperature under high ambient temperatures. Although studies have been reported about the change of sweating rate associated with nocturnal sleep[4-6], the day-night change of threshold for sweating in esophageal temperature of man exercising on a bicycle ergometer in a 25 °C ambient[7], and the circadian variation of sweating responses to heat stimulation[8], to our knowledge no attempts have been made yet to record the sweating rate consecutively for 24 h. Therefore, in the present experiment we endeavoured to measure the sweating rate under constant warm ambient temperature (32 °C) and relative humidity (50–55%) to determine whether or not man has circadian rhythm in his sweating rate. The experiment was executed in August and September 1977 in a climatic chamber with natural sunlight coming through the window. The ambient temperature and relative humidity were controlled constant at 32±1 °C and 50–55%, respectively. 3 males (2: 19 years, 1: 38 years) and 1 female (22 years) served as subjects. Males wore trunks only, and female wore also a low cut sleeveless shirt. Sweating rate was continuously measured from the anterior of the left thigh from noon of one day to noon of the next day by the resistance hygrometry method[9]. A 1 l/min air flow rate passed through the sweat measuring system. The subjects entered the climatic chamber about 1 h (11.00 h) before the recording started. Each sat on a chair from 12.00 to 23.00 h quietly and then lay down without coverlet on a bed with cotton mattress from 23.00 to 7.00 h. From 8.00 to 12.00 h they again sat on a chair. In 3 cases, rectal temperature was recorded every minute with 2 subjects, using copper-constantan thermocouples. Continuous recordings of the sweating rate for 24 h were carried out 6 times with 4 subjects. Representative results of one of the male subjects are depicted in figure 1. As seen in figure 1, the sweating rate decreased definitely during the period 2.00–5.00 h. This reduction during these times of day occurred without exception in all observations with 4 subjects. The average values during the period 2.00–5.00 h were 0.07±0.05 mg/min/cm^2 (mean±SD), which were significantly lower than those (0.12±0.08 mg/min/cm^2) during other times of the day ($p < 0.003$). Furthermore, sleep or sleeplessness seemed to have little influence on this