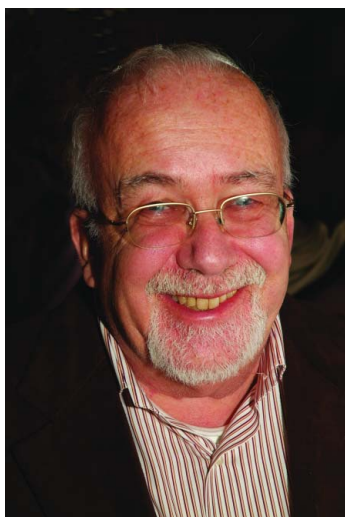


### Aaron Joseph Kalb (Gilboa) (1937–2009)

Dr Aaron Joseph Kalb (Gilboa) (Fig. 1) passed away on 30 December 2009. Joseph was born in 1937 in Bronx, New York City, and received his PhD in Chemistry in 1963 from the University of California Davis. He was recruited as a scientist into the Department of Biophysics of the Weizmann Institute of Science in Rehovot, Israel, in 1965. In 1968 Joseph spent a sabbatical year in the laboratory of Dr Max Perutz in Cambridge, UK, with the intention of becoming a protein crystallographer. Through intensive interaction with post-doctoral fellow Dr Jonathan Greer, Joseph became a fine protein crystallographer during that year and returned to the Weizmann Institute to continue his research on the sugar-

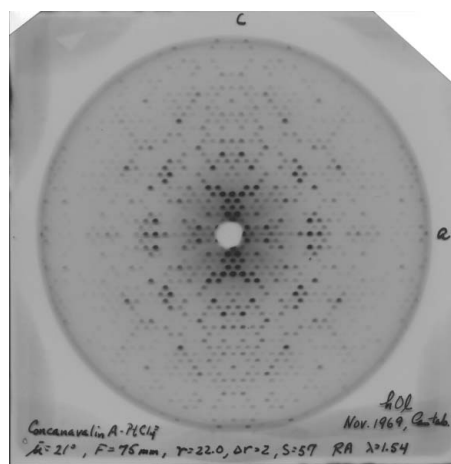


**Figure 1**  
 Aaron Joseph Kalb (Gilboa) (1937–2009).

binding protein concanavalin-A from jack beans (Fig. 2). He succeeded in solving the crystal structure of demetallized concanavalin-A, showing for the first time that the role of the metals (manganese and calcium) was functional rather than structural, as in the absence of the metals the protein structure retained its native three-dimensional fold but lost its sugar-binding ability. The collaboration of Joseph Kalb (Gilboa) with his Weizmann colleague Dr Joseph Yariv in the 1970s and 1980s was fruitful, and together they performed and published a series of what were to become classic works on concanavalin-A.

Always looking for a modern and cutting edge initiative, Joseph became one of the first users of synchrotron radiation for diffraction studies. He collaborated with Dr Robert Sweet

of Brookhaven National Laboratory's NSLS on data collection of the very large protein bacterioferritin from *Escherichia coli* and with Dr John Helliwell of Daresbury Laboratory SRS on structural studies of concanavalin-A in various metallated and saccharide-binding crystal forms. The results of this research have been published as scientific papers leading to several reviews and chapters in scientific books. The structure of the bacterioferritin iron storage protein and simultaneously cytochrome was determined at the beginning of the 1990s with the help of the data collected at the NSLS and at the Photon Factory in KEK, Japan. Joseph performed a fine study of the arabinofuranoside structure in protein crystals and as a small-molecule compound using X-ray and neutron radiation. In the latter phase of his 'official career' he became interested in the



**Figure 2**  
 Precession photograph of the  $h0l$  plane of a  $\text{PtCl}_4$  derivative of concanavalin-A taken in November 1969, MRC laboratory, by Joseph Gilboa.

ultra-high resolution of protein crystals using X-ray and neutron crystallography as definitive experimental tools used in combination for as complete as possible protein crystal structure determination.

After his retirement in 2002 Joseph attended Bar-Ilan University as a continuing student, studying the fine features of the Hebrew language. He did it with the same passion he applied to deciphering the secrets of protein function. Joseph will long be remembered as a compassionate person, fine scientist, great teacher and friend.

**John R. Helliwell**  
 University of Manchester, UK

**Felix Frolow**  
 Tel Aviv University, Israel